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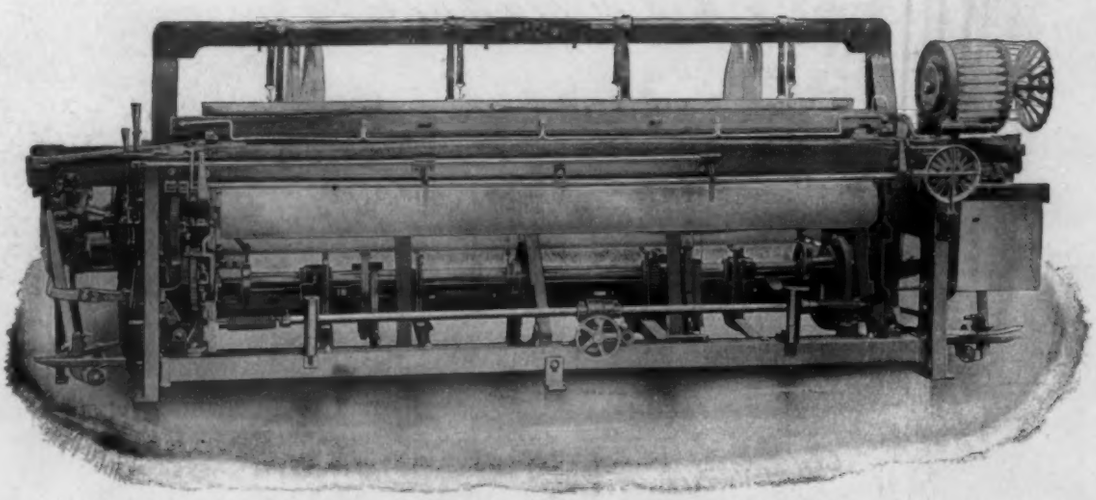

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LEGALIZED IMPOSITION.

One of the beliefs common among operators of Southern textile mills, is that in nearly all the Northern seats of the same industry, an exceedingly intimate and mutually profitable relation exists between the agents of the mills and the municipal and state officials, whereunder everything which the mill owners want is given with the full approbation of the public authorities. It is the habit of certain owners of Southern mills to contrast this popular belief as to ideal conditions in the North, with conditions in certain parts of the South, wherein at times, narrow minded men in public life have worked against the reasonable requests of mill owners for requisite legislation.

The truth is, that in the North there are men in public life whose principal political capital is demagogism directed against mill owners. It was recently brought out at a hearing before an enlightened and progressive governor of a Northern state who among other investments has a good deal of money invested in Northern and Southern textile mills, that in a certain large seat of the textile industry, the several mills paid almost one-fourth of the local taxes and yet for years and years, such was the description of civic government, that the mills had to provide their own fire departments, police service, and do many other things for themselves that should have been done by the municipal government, and for the doing of which the mills and all other taxpayers were paying much more per unit of population to the municipal government than was charged for public service in New York or Philadelphia. Yet despite the high taxes against the mills and other interests in the community referred to, it was found that its civic officers had gotten it into such bad straits that the district was on the verge of bankruptcy, and a movement was set into being to have the municipal government abolished and the district governed by a state commission, after a plan brought forward in Memphis, Tenn., some years ago.

Then came a series of charges by certain politicians in that municipality, that the textile mills had not for many years paid their fair share of taxation. The mill owners at once issued a statement that proved that they had been greatly overtaxed for many years and had paid out, first and last, almost $500,000 for private installations of apparatus as safeguards against fire alone, while they were taxed all the time for a municipal fire department that was unfit to do effective work.

Like conditions exist in other seats of the textile industry. Some time ago, the agent for an Eastern mill that makes about 15 miles of cotton cloth an hour, formulated a plan to use a compressed air locomotive and a system of traction in the yards and through the mills. He desired to eliminate the danger from sparks from the steam locomotives brought into the mill yards and to do away with hand trucks in the mills. In making the plan several bridges were necessary to connect two of the mills upon the sides of a little used city street. The bridges were to cross at an elevation of 22 feet above the level of the streets. Investigation disclosed that 16 feet above the street level was ample

allowance for the clearance of anything usually hauled in the city. The mill agent showed the plans of the bridges to the municipal officers and was told there would be no objection to placing the structures over the street.

In a few days, however, several political sensation mongers induced a paper to publish a statement to the effect that the grinding monopolists who owned certain big mills were going to build bridges over a street and thereby prevent furniture vans from going through, and from which oil and chemicals from freight cars would drip down upon the persons of the people. Several aldermen were much incensed about this matter and made orations showing that Nero in his worst days never built bridges across city streets to oblige cotton mill owners. As it turned out, all that this agitation was worked up for, was in the hope that the mill owners would give some money to certain politicians in order to get through a local ordinance that would legalize the bridges. The mill owners refused to give a cent and abandoned the project to bridge the street, much to their inconvenience.

Another instance of the enmity of short-sighted public officials toward a textile mill is shown in the following case. This mill had lost by fire a large warehouse, filled to the brim with finished goods. The fire came from sparks from a steam locomotive. The time was noon, when only a few mill workers were about. Owing to defects in the city water system the mill section was shut off that day at the mains. The nearest steam fire engine house was more than a mile away. The loss was large on account of the loss of trade on goods burned up; the fire loss was cared for in the regular way of insurance carried by all textile mills. At the next meeting of the mill's directors, it was decided to apply for an enabling act, to lay a railroad track to connect with the steam railroad system, and to take all freight to and from the mill by means of the mill's own compressed air locomotives, thus eliminating the fire danger from the steam locomotives of the railroad; the meeting also voted to install an up to date fire fighting system for the mill and warehouses and for the protection of the many adjacent cottages of employees. But the enabling act and several applied for petitions for rights to the municipal government, were opposed by the bosses of both political parties. Investigation proved that the local bosses proposed to make capital out of the recent mill fire by working up sentiment in favor of the building of an engine house and the placing of a fire company near the mills, and for the enlargement of city mains in that district. As these projects would have brought venal bosses illicit commissions upon the engine house and fire department supplies, and also "strikes" upon makers of water pipe and other supplies, these bosses had no idea of letting an enabling act and other legislation go through at the request of the mill owners. The mill's lawyers did what they could at the Legislature and before the municipal body. But the lawyers saw that all the bosses and their confederates the state over stood together for their own disreputable purposes.

In one of the Northern states, certain coteries of politicians rushed through in the last hour of a legislative session, what they term an "Employers Liability Act." The ostensible purpose of this Act is to provide a way in which employees who are injured while on duty for employers, through the lack of safeguard of machinery, or for other causes, may be assured of winning a suit at law for damages against employers. The real purpose of the Act is to create offices for many henchmen of political bosses, who under the title of "factory inspectors," will try to "ring-in" for side commissions upon so called machinery safeguards that are controlled by certain political bosses. Learned judges in that state have told mill owners that the Act is a cold blooded move against employers.

It so happened that a few days after this Act went into effect, a worker in a textile mill in that state, in playing with a fellow employee, gave him a much harder shove than he intended and threw the man against a fast running set of rolls, in which the victim caught his right hand and arm. By what seemed to be a providential happening, just at the moment the poor fellow was caught, four efficiency engineers stood nearby testing the machinery. All were exceptionally bright and active young men, and as they knew just what to do to stop the machinery, they stopped it very quickly.

Within half an hour, shyster lawyers, looking for business under the employers liability law, put into a local paper an untrue account of the accident that made it appear as if the owner of the mill had put in men and women killing machinery and had refused to install safeguards at the machines. The owner thereupon dictated a plain statement of facts and as he has, for many years, had a receptive mind for new and safe machinery, he stood ready to scrap any machinery that was not what it should be. He stated that the man who was injured was hurt because of the skylarking of his friend, and who had by this skylarking broken a standing rule of conduct that has existed everywhere for time out of mind; that no accident had ever occurred in connection with that machine before; that the injured man was well cared for at the cost of mill, and would be paid full wages while he was ill; and that the man had no idea of bringing suit against the mill. The mill owner's letter was suppressed, and the paper declared that the injured man had been bulldozed into signing an agreement not to bring a suit under the employers liability act. The newspaper proprietor probably knew better, but he chose to support the demagogues who run the district, because he secured through them a lot of municipal, county and state advertising, and of course he received no advertising whatever from the textile mill.

Many years ago, when textile mills were projected for this or that struggling Northern community, the local dignataries used to go down to the railroad station with a brass band and with orators to give warm welcomes to the intending founders of mills. The plants were exempted from taxation; the railroads and steamboats gave very low freight rates to the mills, and the mill agents were highly regarded by the whole population of the towns where the mills were situated. But, nowadays in certain textile mill districts in the North, the mill owners have become to the base sorts of politicians, men to be denounced with tongue and pen, as oppressors, tax dodgers and what not. In order to let unthinking people know just what a straight walking and active kind of a citizen a textile mill operator is, one of that sort agreed to run for a high office in his native state. He has very large interests in Northern and Southern textile mills and machinery making plants. His employees like him well and he has had as few labor troubles as any man in the business. But so soon as he became a candidate for public office a stream of abuse was turned upon him, for which there was no foundation. He won out in the campaign, however, and by lavish expenditures from his own

means for the employment of specialists in civics, sanitation and many sound reforms, he was able to effect some steps forward in the public life of his state.

Knowing the textile business from *a* to *z*, he endeavored to effect through the Legislature a number of practical reforms. But the legislative majority executed war dances upon his messages; mobocrats said that he was a "humbug and a grinder of the faces of the poor," although it was easy for anybody to see in his home town, where some of his mills are located, that this mill owner has carried out for years among his neighbors every principle that he had advanced in his messages as the Governor of a great state. Disgusted with his political experience this textile man declined to run for office again.

The situation in the Southern states is in many ways similar. State legislatures composed largely of representatives from farming communities often show a desire to pass bills very detrimental to the cotton manufacturing interests, while in some cases the real beneficiaries are most difficult to find.

STRIKE BENEFICIARIES.

Some interesting side lights on the Lawrence strike were uncovered by the daily and textile press of that section. Now that the strike itself has become history, the screens may be removed without danger of shocking the sensibilities of the dear public or perhaps setting on foot a congressional investigation. But a strange assortment of "leading ladies" and "matinee heroes" are exposed by such removal. The highly educated and refined lady instructors of Wellesley College, an ultra-fashionable finishing school for girls, lending their aid and influence to men of the class of Haywood and Ettor. One the former head of the Western Federation of Miners of rather dubious notoriety and the other a foreign labor agitator, striving, not for the good of the working people, but for the enrichment of his own pocket and a certain feeling of tyrannical power. In this he emulated a person, O'Brien by name, who boasted before Philadelphia newspaper men a few years ago that he "cracked his whip over 150,000 American working men."

However good the intentions of these ladies may have been, they added to the distress with which they sympathized and by inference indorsed the methods which these people adopted to practically place the city of Lawrence under the rule of anarchy. They helped to make more difficult the work of the authorities in providing for society the protection to which it was entitled. The doctrines of such people are dangerous at all times and extremely so when expounded to young American women during the formative period of their lives. If such doctrines are being taught in Wellesley College it would seem as if the Board of Trustees had a job of housecleaning before them that should be attended to at once.

The real beneficiaries of the strike, however, are the I. W. W. leaders and the agitators. Those ill-omened birds of prey that are always to be found in the immediate vicinity of any labor difficulties, feeding on the resources of the strikers; drawing salaries and expense accounts from the money donated to alleviate distress; and defiling the atmosphere with their false theories and questionable advice.

A recent editorial in *Fibre and Fabric*, which by reason of location has had an excellent opportunity for observing the details of the Lawrence strike, describes the following incidents as illustrative of the character of these agitators. Ettor, for example, was wont to address the strikers in this fashion:

"Comrades, this morning I had breakfast at the home of Comrade So-and-So, and we partook of black bread, spaghetti and a little white wine, the larger part of which was water, but, comrades, I did not care to eat much at that home because I know the family cannot afford to feed me. And, comrades, I do not want to impose upon the suffering martyrs of this battle, nor do I want to live any better than any of you. So that, I ate sparingly and only because I wanted to cheer up our comrade and his family. Comrades, I and your other leaders want nothing better than you have. We are here to suffer with you." (Cheers.)

"When Haywood came to Lawrence there was a celebration in honor of the event. Six of the strike leaders assembled at Boehm's cafe and had a blowout that proved they are masters of the art of ordering the good things of this world. At the end of the festivities there was a check, of course. It read $42. Six in the party! Forty-two dollars! And they say Lawrence is a slow town!

"But this is not all. Recently the muckrakers for the magazines came to Lawrence, with their names parted in the middle, their pink pajamas and appetites whetted for sensations, steaks and booze. A few days after the arrival of the muckrakers they were entertained by strike leaders in the rathskeller of the Needham. There were eight in the party. There were members of both sexes in the party. That sterling friend of the toilers, Bill Haywood, was there. The check was $59. Some newspaper men inquired of a waiter the size of the check. It is said he told them. At any rate the gang whose hearts are bleeding for their suffering comrades insisted that he told and demanded that he be discharged. He was discharged. That happened last week."

These are the men who advised the use of emery in the bearings of the machinery. These are the men who are shameless advocates of force as a means of adjusting the relations between capital and labor. These are the men who sent women out into the snow and zero weather of the early morning to do picket duty, while they gorged themselves with "planked steaks and Pilsner beer" paid for from the strikers' charity fund. These are men of the agitator, strike leader type. Observe them carefully, for history has a knack of repeating itself.

The Asahi reports that the Governor-General of Korea has changed his policy and decided to encourage new enterprises in Korea. As a first step the authorities have decided to promote the establishment of a cotton spinning company, and while in Tokyo Count Terauchi approached the Mitsui Bussan Kaisha on this enterprise. The promotion of any more spinining mills in Japan is opposed to the business policy of the firm, but the suggestion of the Governor-General was accepted and, after a thorough investigation, the Mitsui Bussan has decided to establish a spinning mill in Korea. The New York City office of this company is at 445 Broome street.

A number of cargo boats are being chartered in the trans-Pacific service to carry American cotton to Japan.

BENIGN PROTECTION.

The Heart of the Problem and the High Cost of Living—Excessive Distribution Costs, not Excessive Manufacturing Costs the Real Cause.

(*Contributed to* COTTON.)

BY FRED W. SIMONS, PHILADELPHIA, PA. EX-PRESIDENT NATIONAL ASSOCIATION OF HOSIERY AND UNDERWEAR MANUFACTURERS.

CHAPTER 2.

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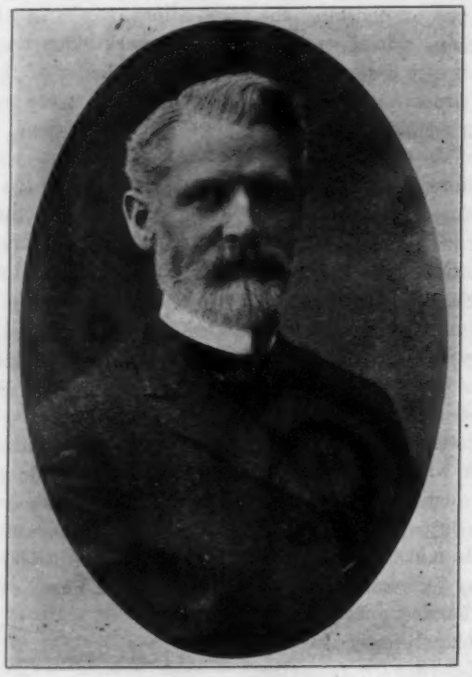
We are dealing with a very abstruse problem, a problem the roots of which ramify in a thousand different directions, touching a thousand different interests in a thousand different ways; a problem still undecided and unsolved in the public mind, and which has apparently baffled and deadlocked the genius of our ablest statesmen. Yet we all recognize that it must and surely will some day be solved. "*Life*" in a recent issue sagely remarks, "The longevity of a public question varies directly with the obfuscation of the public and its inability to formulate an emphatic reply. The oldest living public question we have is the tariff."—*Life*, Oct. 26, 1911.

The difficulty of formulating a reply to so intricate and complicated a question in a manner sufficiently specific and concise to penetrate so much obfuscation is I think sufficiently obvious. I feel, however, irresistably impelled to undertake the task and I crave from the reader a full measure of patience and careful consideration. I am not approaching the subject from the standpoint of its relation to the welfare of any particular interests or classes of society, but from the standpoint of its relation to the welfare of the nation and indeed of the civilized world.



FRED W. SIMONS.

Much of the obfuscation enveloping this and other public questions consists of unconscious bias. It is difficult for parties at interest to take disinterested views. For instance it is difficult for the average merchant to understand the necessity for protection because he has never been subjected to foreign competition and in the very nature of things never can be. The manufacturer can be subject to foreign competition; the work of production can be carried on all over the world, but the work of distribution must be carried on at home and domestic competition is all that the retailer can possibly be subjected to. Yet if you ask him he will assure you that he has competitors "good and plenty." He is subconsciously biased. If free trade would bring him into direct competition with foreign retailers, if it would compel him to sell him merchandise at practically the same price as foreign retailers, in the same manner that it would compel domestic manufacturers to sell their product at practically the same price as foreign manufacturers, then in all probability he might see a new light. And yet that is just exactly what free trade would ultimately do for him.

If a merchant has to pay twice as much for his merchandise as his competitors have to pay, what chance has he? And if a manufacturer has to pay twice as much for his labor as his competitors have to pay, what chance has he? Yet the American manufacturer would be in that position exactly, or even worse, if he were not protected from foreign competition. The American merchant cannot possibly be placed in such a position.

In spite of appearances to the contrary and possible exceptions in specific instances, which go to prove the rule, prices cannot be arbitrarily fixed; they are on the average determined by the general conditions which prevail in society, scarcely anything which is of importance in itself being without its influence in determining values.

All values are but the expression of human appreciation; diamonds would not be worth five cents a bushel if no one wanted them. The progress of mankind in material well being is nothing else than a gradually expanding appreciation of the dignity and value of human effort finding expression in the increased compensation the worker is able to obtain. Therefore human progress calls continually for higher standards of value for the products of human labor.

High wages are necessary to prosperity. High prices for the products of labor are necessary to prosperity.

A standard of values arrived at by world wide competition would not serve as a basis of exchange to a people enjoying great prosperity and if forced upon them would demoralize their activities in almost every direction and put an end to their progress. Free trade would not permit of—and high protection is necessary to—the maintainance of even the minimum standard of values that is consistent with a high degree of prosperity. Prosperity demands as a condition necessary to its existence the maintainance of a standard of values sufficiently high to afford ample com-

pensation to everyone engaged either in producing or distribution, or in any other useful manner.

Neither the truth of the foregoing statement nor its significance is affected by the fact that improvements in meth ods and machinery reduce the cost of production and therefore tend to bring about lower values; it still remains true that increasing the compensation of labor paying higher wages for a given quantity of work—necessarily increases the cost of production; and therefore that in a fair contest, all the conditions except the price of labor being equal, the producing country paying the highest wages cannot successfully compete and must eventually be defeated.

Just to the degree that any commodity is the product of labor the cost of its production will be determined by the wages paid to the labor engaged in producing it. The better labor is compensated, the larger the share it receives of the wealth it produces, the higher will be the range of values legitimately necessary to form a practicable basis of exchange.

The great error of the political economists and their followers lies in their assumption that the free trade theory is the expression of a natural law. The taking of such attitudes in regard to human affairs is almost always fraught with danger to human progress. It arbitrarily disposes of the questions involved, closes the door to discussion and discourages the thoughtful investigation which alone can lead to the correct solution of the problems of life. That free trade may be advantageous to a nation under certain condi tions has been demonstrated, but it is most unphilosophical to assume that the admitted fact precludes the possibility of the converse being equally true.

The free traders have a very pretty, very logical and very moral theory; it was conceived by men of great ability and unquestionable integrity, accepted by scholars as sound doctrine and promulgated by institutions of learning as a cardinal principle of political economy. It has followed as a matter of course that vast numbers of intelligent people conscientiously believe that a policy of unrestricted commercial intercourse is best calculated to promote the welfare and prosperity of the civilized world. And on the face it appears to be about as fair and as sensible a proposition as could possibly be laid down.

Human events, however, have such a way of putting our most carefully conceived theories to rout, that we ought to hold our conclusions constantly subject to revision on the discovery of new facts. It was altogether reasonable for the people to believe that the sun moved round the world until it was discovered that the world turned on its axes; but they would have shown greater wisdom had they given careful consideration to the evidence submitted by Galileo instead of putting him in prison.

The comic opera dictum, "Things aren't always what they seem," finds ready confirmation in the experience of all men, yet in practical life we are exceedingly prone to judge superficially and rate things at their face value. For this reason I hesitate to reduce the case for protection to its simplest terms because the simple truth about protection "don't look the part."

The tariff question is not a simple problem and a superficial examination will not reveal the truth in regard to it. Nevertheless I am going to state the case as briefly as I possibly can and trust to the generosity and fairmindedness of the reader to give me a hearing in an effort to explain apparent paradoxes.

As previously stated it is necessary to the continued progress and prosperity of the American people that they should be permitted to fix values by their own competition without interference; this necessity arises because values in general are determined by conditions in general.

Values for the products of labor are established by general conditions, and the range of values established in one country will not serve as a practicable basis of exchange in another country, and free trade would result in a fusing of conditions seriously to the detriment of the more prosperous country, but not necessarily to the per manent benefit of the other.

Unrestricted commercial intercourse—free trade—betwixt two or more countries would be analogous in its results to a transfusion of blood in both directions between two or more living organisms; but with this difference, that while the stronger and healthier country, (the one in which labor is best conditioned and has made most progress in the process of its emancipation), must suffer, must lose ground and strength by the operation, the weaker country would not benefit in a corresponding degree, and perhaps would obtain no permanent benefit whatever.

The oft repeated assertion of free traders that it does not matter whether wages are high or low provided they represent a sufficient purchasing power is at once a truism and the rankest sophistry, because high wages are necessary and low wages impossible if labor is to receive the largest possible share of its own products.

In the last analysis the great majority of people purchase their requirements with their labor, and living is cheapest when a given amount of labor will purchase the largest quantity of the products of labor, irrespective of market prices as expressed in currency. But the lowest possible market prices as expressed in currency are inconsistent with the greatest possible purchasing power of labor; and the two cannot co-exist.

High prices for the products of labor are a necessary phenomena or manifestation of the prosperity of the people (mark the word "necessary"). They may also be destructive of prosperity; the seeming inconsistency of which remark we will endeavor to explain later. Some sort of subconscious perception of this fact must underlie the ac tivities of those gentlemen who affect to believe in limited protection, and who seem to think it both desirable and practicable to construct a "scientific tariff" that will enable labor to maintain the present wage standard and at the same time leave the employer of labor exposed to foreign competition. Mr. Roosevelt says he is for protection "if the workingman gets it," a remark which would seem to indicate that in Mr. Roosevelt's opinion the "malefactors of great wealth" are the chief beneficiaries of the protective policy.

But capital as such has no protection; there is no import duty on money, and capital or its equivalent credit can be transferred from the far corner of the earth in a few hours, or even a few minutes. It will go where it is best secured and best remunerated, tariff or no tariff. And where the greatest security is offered, it will accept the lowest rate of interest. It is therefore quite possible to decrease the relative cost of capital by increasing the prosperity of labor and so decreasing the risk attending the investment of capital.

And yet it is quite true that capital invested speculatively, that is to say more largely "at the risk of business,"

will prosper most when labor is prosperous, because it is steadily employed and "turned over" oftener. In short the benefits accruing to capital as a result of protection come by way of and are contingent upon the increased pros perity of labor.

The policy of protection pursued by the United States has resulted in increasing the price of labor and its products; it has increased the cost of living as measured by currency, but decreased the cost of living as measured by the purchasing power of labor. "The high cost of living" has of course always been a favorite argument of the free trader and beyond doubt it is a serious problem at the present time; but the high cost of living is not the result of protection. Protection is responsible for high prices only to the extent that high prices tend to real cheapness; the real high cost of living, the struggle to make both ends meet, is due to other causes by no means difficult to identify and which we will endeavor to explore.

The problem of the high cost of living, although a separate problem, is so intimately associated in the public mind with the tariff question that any discussion of the latter would be incomplete if it failed to take cognizance of the former. Perhaps the simplest way of showing that protection is not responsible for the high cost of living is to point out what is responsible for it. The high cost of living is due almost exclusively to the enormous cost of distribution. Is it reasonable that it should cost half as much to distribute merchandise as it costs to produce it? Yet it does cost that much and more.

Besides the free trade theory there are a number of other generally accepted tennets of the so called science of political economy which need to be jetisoned. As for instance, that there is a natural law of trade dubbed by the Economists the law of supply and demand, which regulates prices; the construction placed upon this so-called law being that the more competition there is in business the lower market prices will be, and the cheaper the cost of living. It is upon this hypothesis that the policies now being pursued by the government of this country in relation to the tariff, the trusts and the corporations, is based. Now the policies in question are wrong, and they are wrong because they are based upon a mistaken hypothesis. There is no such law of supply and demand operating in the manner described; or if there is it is knocked into a cocked hat every twenty-four hours—and you know natural laws can't be knocked into cocked hats. If prices were regulated by a natural law they could not go wrong any more than the sun rise could take place at noon time.

The theory that supply and demand regulates prices and that the more competition there is, the lower prices will be looks reasonable enough, but there is no law to that effect either human or Divine. Some times the theory works out all right, some times it don't; it all depends—on many things. Of late years competition has been much more effective in reducing prices in the primary or producers' market than it has in the ultimate or consumers' mar ket; in fact the effect of competition on values in the primary markets has been exactly the opposite of its effect on values in the ultimate markets. In the former it has reduced values; in the latter it has enormously increased them. In fact the high cost of living is due to the enormous cost of distribution, which in turn is due to excessive competition in the retail market.

That statement looks a little doubtful on the face of it I know, but the explanation is that the effect of competition on market prices depends upon the methods used to carry on the fight; upon the weapons offensive and defensive available to the competitors.

In the primary markets the buyers, nine times out of ten, are experts on the merchandise they are purchasing; they know the intrinsic value of the goods as well as the seller, and the market value perhaps better. Practically the only thing the seller in that market can do to secure business is to make the best possible merchandise for the lowest possible price. The buyer is buying to sell again at a profit; he is a trained buyer; buying is his business; he is paid for it. It is his duty to find out the best values the market affords and if he don't do it he will lose his job. So that the seller in the primary markets is practically limited to price cutting in fighting competition; he cannot spend twenty five per cent of the value of his product in brassband methods and put it on his selling price. In the ultimate or retail markets conditions are entirely different; in nine cases out of ten, yes in ninety-nine cases out of every hundred, the buyer is not an expert and does not know the intrinsic value of the merchandise he, (or more frequently she), is buying; and the great retailers of the country can and do spend twenty-five per cent of the cost value of goods in brass band methods and add it onto the selling price. Charge them with it and they will tell you they are forced to do it; that it costs more to "get the business" than it does to do the actual work of distribution. So that excessive competition in the retail markets has put up prices to the consumer and is responsible for the high cost of living.

The great department store is a wonderful institution; it has had an educational influence, the value of which it is hard to overestimate; it has raised the standard of national living; it has refined the public taste; and it affords interesting and instructive recreation to millions of American women. But it has not reduced the cost of distribution, and from an economic standpoint, from the standpoint of a nation struggling with the problem of the high cost of living, the great "Originator" has fallen down on his job.

I am not charging the retailer with graft, nor that he has an unduly large net profit. I am making the averment that the problem of economic distribution is an unsolved problem and that the high cost of living is due to that fact. And I am free to state in this connection that the true principle of protection is not identified, but obscured by the tariff plank in the Chicago platform; and that the import duty that will most benefit the American people is not a duty just sufficient to enable them to compete with foreign producers, but a duty that will protect them entirely from foreign competition, thus enabling them to establish values by their own competition, which values would form the steadiest, most staple and most practical basis of exchange, and permit of uninterrupted industrial and commercial activity.

Moreover, the differential of prime importance in con sidering the welfare of the people is not the difference in cost of production at home and abroad, but the difference between the primary markets and the ultimate markets in this country; the difference between the cost of production and the price charged to the consumer; the difference between the markets in which the people have to sell their labor and the markets in which they have to spend their wages.

I claim also that the method of procedure employed by the government in its efforts to deal with these problems is discriminatory and unfair to the producer. The people don't buy from the manufacturer and if the government wishes to determine whether the people really are imposed upon or not and if so by whom, then the competent method of procedure is to ascertain not only the cost of production, but also the price the consumer has to pay and demand an accounting for the difference. I repeat, protection is not responsible for the high cost of living, and it is only responsible for high prices to the extent that high prices are conducive and necessary to really cheap living.

SOUTHERN COMMERCIAL CONGRESS, COTTON SECTION.

A SUMMARY OF THE SUBJECTS UNDER DISCUSSION AT THE COTTON CONFERENCE AT NASHVILLE, TENNESSEE ON APRIL TENTH.

(*Contributed Exclusively to* COTTON.)

BY HARVIE JORDAN, CHAIRMAN COTTON SECTION.

The Southern Commercial Congress will hold its fourth annual convention at Nashville, Tenn., April 8th, 9th and 10th.

The range of subjects which will be under discussion during the three days conference will cover a very wide field pertaining to the South's social and economic development.

There will, however, be no department of the Congress of more vital interest to the entire welfare of the Southern States, than that of the Cotton Section, the proceedings of which will be held on the morning of the 10th.

As chairman of this section of the Congress I desire to briefly outline through the medium of your valued Journal some of the leading features of that department.

The prime purpose of the Southern Commercial Congress is to aid in the social and industrial uplift of the South, and to exercise the full weight of its powerful influence in bettering the condition of the people and the development of their business avocations. As a means to that end, the Congress now proposes to inaugurate an active campaign toward bringing about as speedily as possible, those economic reforms which are being so strenuously demanded in the baling, handling, marketing and transportation of the cotton crop.

In order that this subject may be fully and accurately discussed, speakers experienced and expert in their respective subjects have been secured to deliver the principal addresses. The following special subjects have been provided, with the names of the speakers who have consented to be present:

"Better Baling and Marketing," by Col. F. L. Maxwell, Mound, La., one of the largest and most successful cotton planters in the South.

"Better Warehouses and Protection From The Elements," by C. C. Hanson, Memphis, Tenn., president of the Gulf Compress Company.

"Financing Cotton In Storage," by John D. Walker, Sparta, Ga., president of sixty banks in Georgia.

Jas. R. MacColl, of Pawtucket, R. I., ex-president of the National Association of Cotton Manufacturers and himself a leading New England cotton manufacturer, has also been invited to be present and discuss "Economic Reforms In The American Cotton Bale," from the spinners standpoint, and if he returns from his present visit abroad in time for the conference we confidently expect his acceptance of the invitation.

These questions involve a practical economic revolution in the future methods to be applied in the baling, handling and marketing of the cotton crop. They constitute live issues in which the producers, transportation companies and the spinners, both domestic and foreign, are vitally interested. Nothing pertaining to the cotton crop, either in its production or consumption, is exciting more interest in the entire cotton industry in America and Europe, than this question of ridding the cotton trade of the present antiquated, wasteful and expensive methods which for the past half century have been employed in the crude and primitive systems of delivering the crop from the farmers to the spinners.

The purpose of the Southern Commercial Congress is to join its efforts to those of the Federal Department of Agriculture, the farmers organizations in the South and the spinners associations, in a commendable effort to lift from the cotton belt the burden of the present national and international disgrace. The strong cooperation which has been for the past year, and which is now being so forcibly given to the movement, by so influential a textile journal as "COTTON," has been of very material aid in focusing the attention of the public, and particularly many departments of the cotton trade, to the necessity for prompt and effective measures to secure these needed reforms.

What is now required above all other things is to inaugurate a campaign of education among the cotton growers and teach them the unbusinesslike features, waste and extravagance of the present system employed in the handling of the crop. The foundation for the introduction of an economic reform must be laid, first, at the ginnery, where the bale is prepared for market, and from there improve the system at all points, until the bale is finally delivered to the spinner for consumption.

Any system which requires the rehandling of a bale of cotton through the medium of a large compress plant to secure the necessary density for transportation purposes will be always fatal to any effort aimed at economic improvement from existing conditions.

The farmer must be taught not only to prepare his cotton for the spinner and transportation purposes at the ginnery, but he must be taught to have his cotton ginned dry and the fibre uncut. He must be taught the necessity for the careful storage of his cotton from the damaging effects of rain, snow, sleet, sunshine, mud and wind. He must be taught to have his cotton bales completely covered with a light, closely woven canvas that will protect the fabre from dirt and trash in its handling and shipment from the point of origin to the final destination.

Quite as imperative as all these other things is the necessity for the construction of ample warehouse facilities at all local interior points throughout the cotton belt, where cotton can be safely stored, insured, financed and slowly sold to meet the gradual needs of consumption. This stability of prices will never be secured so long as the crop is rushed upon the market and sold as a perishable commodity. Widely fluctuating values will dominate the market at the behest of speculators and to the serious detriment of both growers and spinners so long as the dumping process continues. Such a system is not only unwise, but it is unbusinesslike and foolish.

The genius of American inventors has now made it possible and practical to clear the way for applying modern economies to the future baling and handling of the crop, through the extensive introduction of square bale gin compression, and the gradual elimination of the large rehandling compress plants.

At the Nashville conference facts will be presented which will clearly demonstrate, not only the economic value of these reforms to both growers and spinners, but it will be shown and proven by undoubted authority that the mechanical appliances are at hand for the successful introduction of square bale gin compression in the ginneries of the South.

With the adoption of the new bale will quickly follow the other reforms in the building of better warehouses, better protection from the elements and a sounder and more businesslike system of handling and marketing the crop which in the end, will mean the annual saving of millions of dollars to the growers and spinners which is now being recklessly wasted under the present antiquated and expensive methods.

American Cotton Manufacturers' Association.

The sixteenth annual convention of the American Cotton Manufacturers' Association was held at the Hotel Raleigh, Washington, D. C., on the 2nd, 3d and 4th of April. The meeting was one of the largest, most enthusiastic and best attended in the history of the organization. The speakers were men of national reputation and the subjects vital topics of the present day in textile manufacturing. Following is the daily program:

TUESDAY, APRIL 2d, 10:00 A. M.

Call to order by President Ellison A. Smyth.

Annual Address—President Smyth.

Address—"Work of the Bureau of Manufactures," by the Hon Charles Nagel, Secretary, Department of Commerce and Labor, Washington, D. C.

Address—"Illuminating Engineering Co-operation," by G. H. Stickney, of the General Electric Company, Harrison, N. J., and member of the Committee of the Illuminating Engineering Society on Reciprocal Relations with other Societies.

Address—"Growing Long Staple Cotton in the Uplands," by D. R. Coker, Hartsville, S. C.

Address—"The Government's Efforts to Check the Spread of the Cotton Boll Weevil," by Dr. D. W. Hunter, in charge of Southern Field Crop Insect Investigations by the United States Department of Agriculture, Dallas, Tex.

Address—"A Trip in Africa and the Red Sea Districts in Connection with the American Cotton Goods Trade," by Edward C. Suffern, Suffern & Co., New York, N. Y.

WEDNESDAY, APRIL 3d, 10:00 A. M.

Call to order by President Ellison A. Smyth.

Address—"Central and South American Market for Cotton Goods," by the Hon. John Barrett, Director General of the Pan American Union and formerly United States Minister to the Argentine Republic, Panama, and Colombia, Washington, D. C.

Address—"Modern Mill Construction," by J. E. Sirrine, Greenville, S. C.

Address—"The New York Cotton Exchange," by Geo. W. Neville, President, New York, N. Y.

ADJOURN.

3:00 P. M.—Reception to the members and guests of the Association at the White House, by President William Howard Taft.

THURSDAY, APRIL 4th, 10:00 A. M.

Business Meeting.

Call to order by President Ellison A. Smyth.

Report of Bills of Lading Committee, by A. A. Thompson, Chairman.

Report of Joint Committee on Ginning, Baling, Buying and Tare, by T. H. Rennie, Chairman.

Report of Joint Committee on Cotton Exchanges, by Lewis W. Parker, Chairman.

Report of Committee on Tariff and other Legislation, by R. M. Miller, Jr., Chairman.

Report of Statistical Secretary.

Report of Secretary and Treasurer.

Report of Committee on Resolutions.

New Business.

Election of Officers.

Adjourn.

PRESIDENT'S ADDRESS.

President Smyth said in part:

"The year 1911 will go down into the history of the cotton manufacturing trade of the United States as one of the most harassing, unprofitable and disappointing. It was impossible to buy much raw cotton below the 15-cent basis, and with a large crop promising, and the goods market not in a position to take care of a full output, curtailment of production was the order of the day, and throughout the entire country, North and South, mills were more or less running on short time. Even then, however, it was soon apparent that the demand for goods, at or below cost of production, was not sufficient to take care of the supply, and after events showed that the whole industry would have been in a sounder condition if a general curtailment, lasting two or three months, had been enforced. One difficulty was that consumers of goods were able to supply their immediate wants from the surplus that had been stored away, and mills were forced to sell at the best prices offered. Perhaps never before was there so irregular and uncertain a market, and quotations were far from being reliable. Buyers paid only what they were forced to pay when they needed goods, and substitution of low counts and light weights was the rule, and this condition continued until the fall, when lower priced cotton enabled manufacturers to name a still lower price for their product, and buyers then saw it was to their advantage to insist upon securing the standard weights and counts.

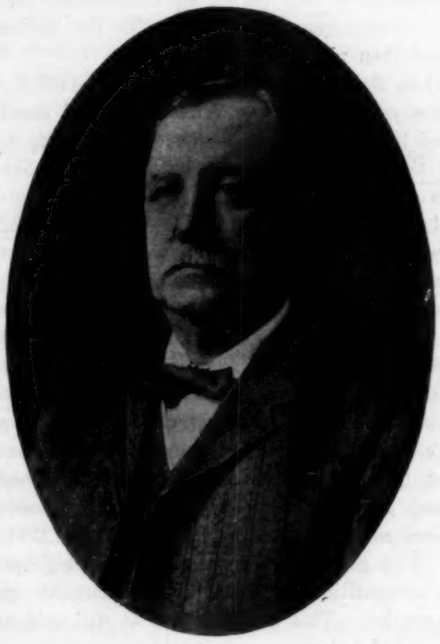
"It has been noticeable, however, that the decline in the price of cotton has been even exceeded by the decline in the value of the manufactured product, and cotton mills have been unable to secure any better profits on 8 to 9-cent cotton than they had secured on 13 to 14-cent cotton. Perhaps the cotton mills would have been better off if the price of raw cotton had not dropped below 11 cents, as on that basis the market seemed more steady and values more permanent than since lower prices for cotton have pre-

vailed. We are now facing a new crop, and the uncertainty as to its possible size and possible selling prices continues, but it is commonly reported that large purchases of cotton, extending over a period of several years, have been made by mills in this country and abroad, based upon lower prices than prevailing at present, and it is to be hoped that this will be one steadying influence for maintaining prices.

"One gratifying feature of the past year has been the systematic investigation of export markets, both for the purpose of regaining fields that had been opened, and also for the purpose of investigating and securing new markets. It has been stated that the Cone Export & Commission Company, Grinnell Willis & Co., a group of South Carolina mills consisting of Pelzer, Piedmont, Easley, Belton and others, the American and Algonquin Printing Companies, the J. Spencer Turner Company, and the Pacific Mills have been making investigations at their own expense and have representatives in foreign countries, seeking information as to the needs of those countries and securing orders. It is also stated that the Putnam-Hooker Company, of Cincinnati, has sent its New York representative to South America for the same purpose, and Woodward, Baldwin & Co. have maintained their own representative in China, who has been located at Shanghai, for a number of years. The exports of cotton goods for the seven months ending January 31, 1912, show over 253,000,000 yards exported, as against 186,000,000 yards for the same period in 1911, and 188,000,000 yards for the same period in 1910. I believe that American manufacturers are becoming fully alive to the importance of maintaining and increasing their export trade, and that efforts will be made, year after year, looking towards systematic efforts to secure a share of the trade of the world that fairly belongs to the American mills.

"The export business with the Philippine Islands has shown marked increase during the past year, and business with China was in a very gratifying and satisfactory volume until the present rebellion and internal disturbances, which have assumed very large proportions, and naturally have caused a prostration of business in certain parts of China, causing a stoppage of all buying on the part of the Chinese merchants. It is believed, however, that the result of the present political agitation will only result in good, and that our country particularly will benefit by the agitation, but it will be necessary for our Government to maintain, without hesitation, the principle of the open door in China.

"Perhaps the subject that has given American manufacturers most concern during the past six months has been the proposed revision of the cotton goods tariff. At your last meeting a standing committee of not less than fifteen was appointed on the tariff and other legislation, whose duty it was to act for and represent the Association, and co-operate with committees from other organizations in all matters of legislation, and that meetings of the same be subject to the call of the chairman of said committee. The committee, when appointed, consisted of representatives from North Carolina, South Carolina, Georgia, Alabama, Mississippi, Kentucky, Tennessee, and Texas, so that all sections of the South should be represented, and take part in the deliberations of the committee. This committee had a conference in Washington, June 6, 1911, with committees from the Arkwright Club and the National Association of Cotton Manufacturers, and prepared a brief which was submitted to Chairman Underwood of the Ways and Means Committee of the National House of Representatives, and the joint committee asked for a hearing before the Committee on Ways and Means on the subject then being considered by the Congressional Committee, namely, the cotton schedule, but the Democratic majority of the committee refused to meet with our representatives. Our Tariff Committee also prepared several very able and interesting bulletins explaining the working of the present tariff, a copy of which was sent to each manufacturer, and also submitted to the Congressional Committee of Ways and Means of the House. It is admitted, of course, that no tariff ever proposed was perfect or absolutely fair and just, but our Association is on record at its meeting in May, 1909, as in favor of a tariff board or commission to investigate conditions under the present tariff and suggest changes that might be desired. As such a board had been appointed, and was investigating the cotton mill conditions in the United States, it seemed fair



PRESIDENT ELLISON A. SMYTH.

and businesslike to wait a few months until that board could give to Congress the benefit of its investigations before proceeding hurriedly to prepare a new cotton goods tariff, and the majority, I believe, of cotton manufacturers in this country were gratified when President Taft vetoed the crudely prepared tariff bill which had passed the Congress. I do not pretend to say that the tariff should not be changed in some respects, but I do claim that it should be changed only after patient and thorough investigation and based on accurate information. What appeals, perhaps, most strongly to Southern manufacturers is not the question whether the cotton tariff is just and right and proper, but the fact that it is a condition, as Cleveland said, not a theory, that confronts us, and Southern manufacturers have been instrumental in securing investments of millions of dollars in Southern cotton mills, under existing conditions and under present costs, which investments would be sadly jeopardized and impaired by radical and sudden changes in the tariff.

"In this connection I want to quote from the New York *Journal of Commerce*, of January 2, 1912, the following article, which speaks for itself, and perhaps gives information that is not generally known or recognized:

"'There is a cloth now popularly used by rich and poor in this country called by various names, such as india linon, fine lawns, batiste, fine organdies and a host of trade-marked names quite as well known in dry goods circles as Fruit of the Loom sheeting. This cloth may be made from yarns numbers 60s, 80s, 100s, or 120s warps. Sheetings are made from yarns numbers 20s to 40s warps.

"'Twenty or more years ago there were not many mills, surely not a dozen, in which cloths of this character could be made in competition with the imported lines. The few manufacturers and merchants who were encouraging domestic production were met from the beginning with the the fiercest competition from foreign mills whose merchandising was looked after by importers. Most of the product then went into what were termed white goods, and it was no uncommon thing for English mills to dump upon this market, in a dull period in Lancashire, hundreds of cases on consignment to compete with the limited output which was then possible here.

"'When the new principle of tariff taxation in cotton goods was embodied in the Wilson bill, and amplified and improved later in the bills that succeeded it, up to and including the Dingley bill, it was felt that when general business conditions improved investors could be drawn to place their money in the finer yarn factories. The idea was sonud, for with the improvement that started in this country after 1898 interest in fine cotton mill properties increased greatly, until it culminated in the great boom in mill building noted in New Bedford in the last half of the past decade.

"'To test out in figures the real merit in the contention that this stimulation of industry by a special protection to the element of labor in production would be and was reflected in lower prices and greater abundance for the consumer, a specific line of india linon was selected and the prices current for it in 1889-1892 and 1911 were secured. The goods in the first years were imported and sold in competition with one line of domestic goods then on the market. This domestic line is still sold and at the prices quoted below.

India Linon Prices

Count	Width Inches	Prices 1889-1892	Prices Today
60 x 60	28	6 c.	5¼c.
64 x 60	30	7 c.	5¾c.
64 x 64	30	7½c.	6 c.
68 x 68	30	7¾c.	6¼c.
72 x 72	30	8¼c.	6½c.
76 x 72	30	8½c.	6⅝c.
76 x 76	30	9 c.	6¾c.
80 x 80	33	9½c.	7½c.
76 x 84	33	10 c.	7⅝c.
84 x 84	33	10½c.	7⅞c.
88 x 84	33	11 c.	8 c.
92 x 88	33	12 c.	8½c.
92 x 96	33	13 c.	9 c.
96 x 100	33	14 c.	9½c.
96 x 104	33	15 c.	9¾c.
100 x 108	33	16 c.	10¾c.
104 x 112	33	17½c.	11½c.
108 x 120	33	19 c.	12½c.
112 x 124	33	21 c.	14 c.

Prices above are for the same counts and widths.

"'It will be noted that the greatest reductions have occurred in the higher priced and more closely woven cloths. The prices quoted at this moment are relatively high because the goods were made from the very high cost cotton of last year, but they are still so low that some of the cloths are actually selling cheaper per yard than a wholesale merchant in Manchester gets for them for shipment out of England. Today hardly a yard of these goods is brought in here, and the same importers who tried to crush out the domestic industry when it was started are now selling only the domestic goods, and one of them said, 'They are the best goods of their class in the world today.'

"I would suggest for further consideration by our Association the appointment of a Committee on Rules for Cotton Buying, seeking some uniformity of action with manufacturers, North and South, and establishing rules that will be uniform, generally observed, and alike fair to buyer and seller, and providing for the settling of disputes without recourse to the courts.

"The grey goods contract which was prepared by a joint committee from our Association and the National Association, and formally accepted by our Association, has made slow progress in being put into general use, but we believe that this form of contract will be in the future the generally adopted form and basis of trading, and it is to be hoped that the contract will become gradually and steadily in use, and that sentiment will so crystallize around it that the widespread cancellations that we had in 1908, and the disputes that followed, will be avoided.

"You have doubtless read the report from the Bureau of Labor of the United States Government, to be found in Vol. XVI of the Report on Women and Child Earners, on typical cotton mill workers, which is unfair and unjust to Southern cotton mill people, and doubtless is also to those of New England. One glaring omission that is always found in the so-called investigations of professional philanthropists or paid emissaries is a fair comparison of present conditions and standard of living with former surroundings, and in this report it is conspicuously lacking. It is also always noticeable in the so-called investigations of Southern mill conditions that isolated cases of hardship and low standard of living are greatly exaggerated, and the many mill villages in our Southern states with a contented, prosperous population, surrounded by many comforts, and those people maintaining a high standard of living, are purposely overlooked and unnoticed."

The work of the Bureau of Manufactures was explained in an interesting manner by the Hon. Charles Nagel, Secretary of the Department of Commerce and Labor. Owing to lack of space the resume of his address will be deferred until a later issue.

Illuminating Engineering Co-Operation.

G. H. Stickney, of the General Electric Company, Harrison, N. J. presented some interesting ideas in his paper on the above subject. Mr. Stickney said:

"It is well within the memory of the present generation when artificial light was but little used in industries and all work ceased with the setting of the sun. In those days the open flame gas or kerosene lamp were only available; these being later followed by the later so-called "2,000

candlepower" open arc and 16 candlepower incandescent electric lamps and the incandescent mantle lamps. No effective auxiliaries were available and no one realized the advantage to be gained by properly arranging and equipping the lighting units.

"Times have changed with regard to the use of light. The last decade has seen a revolution in lighting units and methods. The gains in efficiency of light production have exceeded anything in other lines of development and surpassed the dreams of even the most imaginative. Improvements in methods of installation and equipment have followed rapidly and this, with the lessened cost of light and realization of its value, has increased the popularity of artificial light until today its use is as widespread as its successful activity.

"With the large number of lighting units and devices now available and the realization of the economy to be effected by the proper selection and installation of units, the engineer responsible for a lighting installation is confronted with many complex and important problems. Not only must he secure effectiveness and economy, but his installation must conform with the rapidly rising standard of lighting practice.

"The advent of the Illuminating Engineering Society was coincident with the inception of this portentious movement. It was undoubtedly a result of the movement; on the other hand, it has been an important cause and guiding element in its activity. Inasmuch as light and illumination are closely associated with every form of human endeavor, the Illuminating Engineering Society finds that its field borders on that of nearly every industrial and civic organization.

"Another happy circumstance has developed within the past few years: the commercial world has just learned the value of co-operation. Hence it is that the Illuminating Engineering Society has realized the common ground between it and other organizations and has come to appreciate the great benefits which may be secured through mutual co-operation. To apply this idea, Dr. A. E. Kennelly, the 1911 President of the Society, appointed a Committee on Reciprocal Relations with other Societies. Dr. H. E. Ives, of Cleveland, is chairman and the present speaker one of the several members. Under the leadership of Dr. Ives, this committee has prepared a tentative method of procedure with a view to securing the results desired. A list of live, representative organizations with whom co-operation seemed desirable, has been prepared and advances made by various members of the committee. Without exception, our suggestions have been received with cordial and prompt support.

"Some of the first fruits are the joint meetings which the New York section has projected with the American Institute of Electrical Engineers and the Institute of Architects. The presence here today of the speaker is the result of your interest in the necessity for co-operation, and it is hoped that you will be so impressed with the advantages of this activity that we can establish a relationship that will be productive of great mutual help.

"Now let us consider the existing conditions. You represent a large body of light-consumers desirous of obtaining effective, reliable and economical illumination for the purposes of your business; we represent a large body of those devoted to the production and utilization of light, who are interested in the advancement of the art of illumination and the extension of its usefulness. We need your practical experience in building up our knowledge of the art of illumination. You need our development and lighting experience for application to your particular problems. How can we help each other?

"There seems to be three promising avenues for the advancement of intersociety co-operation, namely:

"A—Formation of a joint committee on mill lighting practice.

"B—Holding of joint meetings, and

"C—Exchange of papers at conventions and meetings.

"Joint Committee.—In accordance with the idea, a committee on the practice of cotton mill lighting would be formed, either as a joint committee between the two societies, or as a committee in the Cotton Manufacturers' Association on which the Illuminating Engineering Society would be represented.

"The purpose of this committee would be to study the illumination practice and requirements for various processes of cotton manufacturing to the end of recommending for standardization such practice as may seem, under the conditions, to be most desirable. The report of such committee should provide data which would be of especial value to both organizations.

"Joint Meetings.—The Illuminating Engineering Society has sections established in Boston, New York, Philadelphia, Pittsburg and Chicago. Arrangements have been made in the past for joint meetings of this Society with the American Institute of Electrical Engineers and other engineering organizations. There are several meetings of this type projected in the near future. The usual plan has been to select a subject of mutual interest to the two societies and have papers presented by representatives of the two societies, either separately or jointly, members of both societies entering into the discussion. There seems to be some question as to the practicability of this scheme in this instance, inasmuch as the Illuminating Engineering Society has no section in the part of the country in which, it is understood by the speaker, the American Cotton Manufacturers Association is principally represented. It is possible, however, that some modification of this idea could be adopted.

"Inter-Society Papers at Conventions and Meetings.—The Illuminating Engineering Society would welcome at its annual conventions or at section meetings, papers on the subject of cotton mill illumination by representatives appointed by your association, and, on the other hand, stands ready to suggest or recommend authors from the membership of the Illuminating Engineering Society who might present papers on lighting at your conventions from the standpoint of the illuminating engineer. Moreover, when such subjects are under discussion we would be glad to suggest others capable of discussing the subject, or, reciprocally, to have the suggestions made by your association in connection with our meetings.

"The adoption of one or more of these means of intersociety co-operation must necessarily have a broadening and educating effect in both organizations. Such papers and discussions representing, as they would, the different points of view, cannot fail to enlarge the viewpoint of the members.

"The speaker will be exceedingly glad to discuss these propositions further and hopes that the interest aroused

will bring forth definite and concrete suggestions from your members."

The next address on the program was by David R. Coker, of Hartsville, S. C., on

DOES THE AMERICAN COTTON INDUSTRY NEED THE PLANT BREEDER?

Mr. Coker said in part:

"The steady advance of the boll weevil into the cotton belt has produced alarming results. Most of the best upland cottons formerly produced in the United States were raised in the western portion of the cotton belt, nearly all parts of which have now been invaded by the weevil. The varieties generally planted there were late in maturing, and, being unsuited to boll weevil conditions, have been mostly abandoned. In their place have been introduced the earliest and shortest staple varieties, for only these mature in time to get ahead of the weevil.

"The general introduction of extremely short varieties into so large an area has caused a distinct decline in the average staple of the American crop. As the boll weevil advances, this decline will continue unless counteracted by prompt and intelligent effort. Spinners of long staple uplands are *now* confronted with a serious shortage of 13/16 to 1⅛ inches cotton and it seems doubtful that a sufficient amount of these lengths will be produced this year to fully supply the demand. Besides, it is no longer possible to get at moderate premiums 1 1/16 to 1⅛ inch cotton, of which the western part of the belt formerly furnished an abundant supply.

"Under these circumstances it would seem that the whole body of American cotton spinners would eagerly welcome and aid in promoting any plan which may be expected to arrest the progressive deterioration of the American cotton crop which appears to be now going on. If any plan offered gives promise of distinctly advancing the crop in length and spinning quality beyond any previous maximum, it would seem an additional reason why the spinner should bestir himself in its behalf.

"The problem, I think, can be solved by promoting the scientific breeding of cotton for length, earliness and high yield. By distributing the seed thus bred and at the same time disseminating among the planters by bulletins, lectures and institutes a sufficient knowledge of plant breeding to enable them to at least keep their seed from deteriorating. By instructing the planters in correct methods of handling and marketing staple cotton, and by awakening the cotton trade to the necessity of providing good markets for staple cottons and also to the desirability of paying more attention to the length and uniformity of *all* cotton.

"It seems to me that much could be accomplished in calling attention to the immense importance of this work and in securing the desired co-operation for its promotion, by a carefully selected committee of your organization with sufficient funds at their disposal. Under their direction literature on this subject could be prepared and distributed and, I think, with proper effort all the agencies mentioned above and a number of others could be brought into close-operation for the purpose of seconding your committee's propaganda for the betterment of the quality of the crop.

"Upland cotton breeding was begun in our state about twelve years ago by Dr. H. J. Webber, of the Plant Breeding Bureau of the United States Department of Agriculture. Within six or seven years he had developed from short staple selections two most excellent varieties. Both of these varieties have ever since their introduction been regularly producing at least as much cotton per acre as the average of the short staple sorts. The writer also took up cotton breeding about ten years ago and has produced one variety by the selection of notably good plants from a short staple variety and breeding from the best of their progeny in each generation for five years.

"According to the South Carolina Experiment Station records my established varieties possess the desirable characters of high yield, long lint and even staple. I have had a hard fight to convince our staple spinners that these pedigreed staple varieties are entirely different from the old, non-productive, wasty, staples which were formerly produced in small amounts in our territory, but I can say that those who have tested them to any extent now buy them freely on at least equal terms with western staples, and some have expressed a decided preference for them.

"About three years ago the Cotton Manufacturers Association of South Carolina contributed a considerable sum of money to be expended by the South Carolina division of the United States Farm Demonstration Bureau in the testing and distribution of the new pedigreed staple cottons. One of the prominent mill treasurers of the State also contributed liberally to this fund and he and a number of other prominent spinners and also our Secretary of Agriculture have given much encouragement to this industry.

"The result so far has been that a large proportion of the staple cotton needed by South Carolina mills during the current year has been produced within the borders of the State and, unless all signs fail, South Carolina will produce more than enough staple cotton this year to supply all the staple spinners of both North and South Carolina.

"At the last annual meeting of the Cotton Manufacturers Association of South Carolina I presented an argument for the buying of all Cottons strictly on staple, calling attention to the fact that short staple varieties vary tremendously in length and quality and yet, in most of our cotton markets, all sell at the same price. Some of these varieties average not over ⅝-inch in length and others which are equally productive are about 1 1/16-inch. If all the cotton mills would refuse to buy cotton except on staple, would have the length of every bale purchased by them carefully determined before accepting it, and would discriminate in price against cotton of inferior staple, this in itself would very quickly drive out the shorter varieties, besides being of obvious benefit to the mills.

"The value of the plant breeder's work is no longer open to question. In almost every department of plant life to which he has devoted any effort, the results have been prompt and valuable—often incalculably so. Many millions have already been added to the wealth of the United States by the plant breeder. Hundreds of the brightest minds of the country, many of them in the Bureau of Plant Industries here in Washington, are engaged, through plant breeding, in assisting Nature to produce better and more bountiful harvests.

"There is little reason to doubt, from the inculculable value of the work of the plant breeder in other departments and the considerable results already accomplished in cotton breeding, that by earnest co-operative effort every desirable feature of the cotton plant can be greatly improved to the immense benefit of the industry, and it is my hope that your association will have a prominent part in bringing our

planters to a prompt realization of the vital relation that exists between plant breeding and the prosperity of both the cotton producer and the cotton spinner."

In the next address Dr. W. D. Hunter, of the Department of Agriculture gave an interesting description of the Government's efforts to check the spread of the cotton boll weevil. Dr. Hunter, as the official head of the Southern Field Crop Insect Investigations of the Department was well qualified to discuss this subject, which he did in a very able manner.

The next paper to be read was a discription of a trip in Africa and the Red Sea districts in connection with the American cotton goods trade, by Edward C. Suffern, of Suffern & Co., of New York.

Mr. Suffern said: "During the early part of 1910, a number of American cotton mills decided to send a representative to Africa and the Red Sea districts in order to inquire into the causes for the decline of certain foreign trade and to report to them such steps as might be necessary to increase their present business. They chose me to act in their behalf in the matter, since I was not only familiar with the customs and the conditions prevailing in the countries they wished to reach, but had many warm friends among the leading people in that section.

"In September, of 1910, I left New York for Africa, first going to London and then crossing the Channel into France, and on to Marseilles, from which point I took a French boat to Aden. Aden is probably too well known to need much description, but it is an interesting old Arab town and is of great commereial and political importance. It has much the same relative position to the Red Sea, in guarding its entrance, that Gibraltar has to the Mediterranean, and for many years past it has been prominent as a port of entry for the interior of Arabia, the Persian gulf, Africa and the smaller Red Sea ports.

"It was not many years ago that "Americania" or gray cotton sheeting played a most important part in the commerce of this part of the world, and it is still of much consequence, but the inroads made into the American trade by our foreign competitors have been serious, although I feel that America is regaining much of her lost ground; still it is not pleasant to realize that one or two houses that have their buying offices in New York are not content with importing the American goods, but also import into Aden competing Italian and English fabrics.

"To go back to my trip. From Aden I crossed the Red Sea to Djibouti, in French Somaliland. Djibouti is far different from Aden, and the few palms and bits of green here and there make a most acceptable change from the desert-like character of the port of Aden. I went by railway from Djibouti to Dire Doaua, a distance of 191 miles, which takes from eight to thirty-six hours, depending on the condition of the road. I once waited in Dire Doaua two weeks for the railroad to be repaired. Dire Dauau was the last place that I would see for some time where there were real hotels and a white community. It was Christmas Eve when I arrived there and it was a trifle forlorn. Most of my baggage was in the custom-house—including a plum pudding which I had brought from America for that especial night. However, I found a piece of fruit cake, "Made in Germany," and it was not a bad substitute. A day or two later I started off for Harrar, thirty-five miles away. I had sent my heavy baggage on by camels and had with me a couple of small tin boxes on one mule, my sleeping outfit and my boy's box on the other mule, and started off to Harrar with a couple of boys to look after the two baggage mules, an Abyssinian who was mounted to lead the way, my boy and myself on two forlorn hired mules. We were not a very talkative party, as no two of the boys could speak the same language and accordingly such conversation as there was was carried on between Ishmael, who had been my constant companion for some time, and myself. Unfortunately, it was impossible to start in the early morning, and it was 10:30 or 11 o'clock before we got under way, and I knew it was necessary to hurry things along as quickly as possible if we wished to reach Harrar that evening.

"The mules and the boys were slow and the way was very, very steep, and how it was possible for mules to walk up the sheer straight rock is a thing I have never been able to understand. At times I tried to hurry them along by going a mile or two in front, but I did not care to lose the small party entirely and accordingly I would have to wait for them. The gates of Harrar are closed at 6:30 or thereabouts, depending upon what the gatekeeper considers 6:30, and so when it became late in the afternoon and no signs of any city were visible I had visions of sleeping in an Abyssinian hut, and while I have done such things and have not minded them, I was at that time somewhat new to Abyssinia. My rhino-hide riding whip was softer than my mules hides, and the most vigorous beatings had no effect on making them hurry, and so you may imagine how pleased I was when suddenly the guide stopped and made a sharp turn and we found ourselves riding through one of the gates of Harrar.

"The streets were miserable little dark places, sometimes only wide enough for one mule to squeeze by at a time, most terribly uneven and filthy. Harrar has many dogs, and as they make a special point of always dying in the streets, their bones are laying all around, probably not particularly adding to the sanitation of an already filthy city.

"I was welcomed in the hotel by an Englishman whom I knew well by reputation and we and two Germans made up the entire European or American population of a city, of, I believe, 100,000 inhabitants. There were, however, a number of Greeks, Armenians, Turks, etc. The hotel had only three bedrooms and as I was the last arrival, of course mine was the poorest. There was a door which did not close, and nothing aproaching a window, but again I was pleased to see that there was one sign of America in the "Americani" or cotton sheeting covering the walls and ceiling of this mud room. Harrar was the starting point of my long trip into the interior, and as I had never seen nor talked with a person who had been to Adis Abeba, the capital of Abyssinia, I, of course, experienced much difficulty in getting my caravan together, buying my mules, engaging mule men, soldiers, cooks, wood boys, tent boys, etc., without end, and the delay was further a source of annoyance to me as I had a number of communications from Adis Abeba urging me to reach there as soon as possible. However, at last everything was complete and I sent my caravan off one morning to follow the next day with my head boy and my head soldier, the other boys all having gone along with the Caravan. The first day was rather a hard trip, as I had planned to cover a much longer distance than is usually taken in one day, but after that we probably did not average over fourteen to eighteen miles a

day. It was the most beautiful and interesting trip I have ever had, the way up leading over high mountains and through vast forests of virgin timber, the scenery varying from tropical to semi-tropical and even temperate. At times the effect of the forest would be rather that of flowers, vines, etc., growing from heaven downward, as in fact they did, as many of the plants and vines are parasites. The denseness, the beauty of the whole effect, made it hard to realize that it was not all merely a picture or a dream. In this particular part of the country there was very little game, and I am ashamed to say that I used to shoot at the monkeys just to keep in practice. However, we later came to an entirely different part of the country, where there were a certain amount of large game and quantities of guinea fowl, pigeons, and small game, so that our larder was always well stocked.

"In Adis Abeba I was received most warmly, doubtless due to the fact that any stranger is a welcomed diversion. I had the pleasure of meeting the present Emperor and most of the members of his government. There are but very few European merchants, but a fair amount of trading is done there by several Armenian and Abyssinian traders who import Americani and send it into the outlying districts in exchange for the produce of the country, rubber, wax, etc.

"I wish there were time to tell you some of the strange and interesting customs of this half-wild and half-civilized but ancient country. After a stay of some weeks I returned by another and far different route, spending days in the broiling heat of the desert.

"In reference to Abyssinia, it was rather a shock to me when I was in Manchester, the other day, to learn that the first pure cotton shipment of English-made cloth was on its way to Abyssinia. This means that the great stronghold of our mills, viz.: the making of pure cotton cloth, has now been taken up by certain of the English mills, because the small native traders have all recently had shown to them the advantages of our pure cloths over the sized goods of the other nations. It is not out of the way here to speak of the vast difference between the policies of the English or other foreign mills and that of the American mills. The mills of England are ready to alter their constructions, change their looms, etc., as much as required by the foreign purchaser, whereas the mills of this country are far too tightly bound to the old customs, and when a new cloth or something a little out of the ordinary is asked, a flat refusal to make any change is apt to be the result. Perhaps this policy may have had some bearing on the fact that last year the increase in British foreign trade in cotton piece goods was as great as the whole foreign cotton goods trade of America. This is rather appalling and our only remedy is to cater to the export business and follow its requirements more intelligently. There are, we know, certain mills in the States which are anxious to hold and increase their foreign trade, but even they are far too prone to keep to what they think will meet the requirements, rather than that which is actually wanted.

"There are certain large lines of business which could be secured by American mills if they would make slight changes in their present equipment. The foreign field is only scratched at present, and there is a great opportunity for the extension of this business through the introduction of new cloths and a more consistent and accommodating policy. This paper will show, however, that certain manufacturers are fully alive to all opportunities and that by some at least every legitimate effort is being made to encourage the export business.

"British manufacturers have built up their export business largely by adhering to the Indent houses, or, as we call them here, Export Commission houses. The British merchants work hand in glove with these firms of foreign shippers, who by their own financial resources, coupled with backing of foreign banks and financial institutions, make possible the easy extension of commerce to the outlying corners of the world.

"The native knows quite well what he wishes, and it is only natural that the mills which do cater to this trade and do attempt to meet the requirements are the ones which hold and increase their export trade. The native house must have absolute confidence in the people from whom they purchase and be sure that the goods will arrive according to the sample. There have occasionally been a few rather unresponsible American merchants who have attempted to enter the export market and who have really done great damage to this trade, but fortunately such cases are few and far between.

"It might be mentioned that one of the greatest difficulties which the merchant seeking export trade has to overcome is that of finance. It is but in rare instances that the foreign purchaser is either willing or able and in many cases is far too ignorant to satisfactorily finance the business, and to give credit to these men is taking a far greater risk than the profits of the transactions would warrant. However, the export market forms a vast outlet for the products of our American cotton mills, and the opportunity which is waiting for them in the foreign fields is large, but can only be gained through a careful study and an intelligent management of that part of their business."

Pan-American Markets for Cotton Goods.

This was the very practical and interesting subject of the Wednesday morning address of the Hon. John Barrett, Director General of the Pan American Union and formerly United States Minister to the Argentine Republic, Panama and Columbia.

"By way of introduction, the relationship of the Pan American Union to the subject under discussion should be briefly stated," said Mr. Barrett. "The Pan American Union is an international organization maintained by all of the American republics. It is not simply subordinate to the United States Government or a bureau of the State Department, as is sometimes supposed. It belongs to each one of the twenty republics lying south of the United States as much as it does to the United States. The Pan American Union is maintained, in short, by all of the twenty-one American republics from the United States south to Argentina and Chile, each government contributing pro rata of population to its support. It is controlled by a governing board made up of the ambassadors and ministers of the Latin American countries accredited to the United States Government and the Secretary of State of the United States, who is chairman *ex officio*. Its affairs are directed by a director general and assistant director, who are chosen by this governing board. These officers are in turn assisted by a staff of commercial and trade experts, statisticians, compilers, editors, translators, librarians, stenographers and clerks.

"The great object of the Pan American Union is to develop commerce, closer intercourse and better acquaintance among all the American nations; and for the accomplishment of this object it is in touch with both North and South America, and in fact with all of the world, with government officials, commercial organizations, manufacturers, merchants, exporters and importers, and shipping interests, while on general lines it is in touch with men in public life, editors, newspaper men, college presidents, professors, students, scientists, travelers, and others, providing them all with information which will increase their knowledge of or interest in the twenty-one American nations. It publishes an illustrated monthly bulletin which is in great demand in all parts of the world as a carefully edited and attractive record of the present conditions, general progress, commerce, laws, new enterprises, and particular development of each American republic. The Pan American Union also publishes numerous handbooks, pamphlets, special reports and maps, of which a printed list can be obtained upon application.

"Almost at our doors lie twenty Latin American republics whose imports of foreign manufactured goods now amount to much over one thousand millions of dollars per annum. This trade is increasing year by year at a constant ratio, taking the fat years with the lean years and averaging the same, of from 11 to 12 per cent. These countries are rich and prosperous, rich not only in the potentialities of the future, and no man who has seen them doubts that these potentialities will be realized, but rich in the present. The per capita foreign trade of Latin America, imports and exports taken together, for 1910, the last year for which we have complete statistics, amounted to $31.82. For the same year the per capita foreign trade of the United States was $37.18. The per capita of Latin American imports was $14.36, and of exports $17.46. The comparative figures for the United States were $16.96 and $20.22. In a number of the Latin American countries the per capita foreign trade far exceeded that of the United States, i. e., Cuba, per capita of imports $48.01, of exports $69.88, or total $117.89; Argentina, imports $48.82, exports $51.72, total $100.54; Uruguay, imports $38.49, exports $38.97, total $77.46; Chile, imports $30.89, exports $34.29, total $65.18.

"The following table of imports of Latin American countries in 1910, showing the share of the four leading commercial nations, the United Kingdom, Germany, France, and the United States, has been compiled in the Pan American Union from the original official customs reports of the several countries.

Countries	Total Imports	From United Kingdom	From Germany	From France	From United States
Mexico	$97,432,891	$11,125,808	$10,134,038	$8,715,422	$56,421,551
Guatemala	5,251,317	1,135,420	1,249,559	273,215	2,181,859
Salvador	3,745,249	1,165,993	407,392	262,294	1,346,597
Honduras	3,019,416	424,077	284,387	101,720	2,059,522
Nicaragua	2,583,257	625,668	286,408	131,826	1,341,692
Costa Rica	8,152,501	1,318,474	974,371	321,106	4,181,506
Panama	10,056,994	2,166,989	966,151	307,982	5,652,653
Cuba	103,675,581	12,292,219	6,542,760	5,514,939	54,569,393
Dominican Republic	6,408,838	708,612	1,108,375	266,667	3,884,918
Haiti	5,880,678	586,190	196,886	644,315	4,271,046
Latin N. A Republics	$246,206,722	$31,549,360	$22,150,327	$16,499,486	$135,910,767
Per cent of total imports		12.00	8.99	6.70	55.20

Countries	Total Imports	From United Kingdom	From Germany	From France	From United States
Argentine Republic	$341,217,536	$106,096,072	$59,295,021	$32,641,121	$46,966,325
Bolivia	18,135,000	5,060,452	2,487,824	251,773	1,241,925
Brazil	235,574,837	67,061,065	37,455,530	22,268,307	30,253,918
Chile	108,582,279	34,340,573	26,296,071	7,010,929	13,369,774
Columbia	17,025,637	*4,100,000	*2,600,000	*1,700,000	*5,100,000
Ecuador	8,024,105	2,483,945	1,574,135	526,615	2,254,303
Paraguay	5,374,837	1,244,533	733,082	234,898	202,766
Peru	22,508,021	7,619,984	3,339,951	950,516	4,112,180
Uraguay	42,796,706	12,125,682	6,438,561	3,765,166	3,457,195
Venezuela	12,387,552	3,625,681	2,039,287	998,906	3,788,539
S. A. Republics	$811,626,510	$243,757,987	$142,259,462	$70,348,231	$110,746,925
Per cent of total imports		30.03	17.52	8.67	13.64
Total of the Twenty Republics	$1,057,833,232	$275,307,347	$164,409,789	$86,847,717	$246,657,692
Per cent of total imports		26.03	15.54	8.21	23.31

*Estimates

"Over three-fourths (76.8 per cent) of all imports of Latin America were of the ten republics of South America, and something less than one-fourth (23.2 per cent) of the ten republics north of the Isthmus. Of the one-fourth, our

share was more than one-half (55.2 per cent), but of the three-fourths of South America our share was less than one-seventh. Most significant of all, this one-seventh represents only a few lines of trade.

"Whereas Latin American and particularly South American imports cover the whole range of human needs, wants, and luxuries—for these are not manufacturing countries but producers of primary foods, metals, and raw materials—the United States supplies these demands only for a very limited number of things. Subtract from our export trade to South America coal oil, railway material, agricultural machinery, patent medicines and drugs, sewing machines, small tools, automobiles, boots and shoes, and but little remains. Among what does remain the cotton textile industry makes no very brilliant showing, yet the sum total of all imports manufactures of cotton into South America is at least equivalent to a sum equal to the total imports at present from the United States.

"On account of the differences in classification it is not feasible to make a table showing South American imports

Hon. John Barrett.

of cotton goods covering more than one country in a single table. In some countries the various textiles are not differentiated; in others, piece goods, yarns, and ready-made clothing are grouped together, and in all of them there is more or less over-lapping in all classes of mixed goods, so that no composite table could be constructed. But from a careful study of individual statistics of these countries, it is safe to estimate the cotton manufactures imports of South America at a sum considerably exceeding $100,000,000 per annum. Of this amount the share of the United States is so inconsiderable as frequently not to be differentiated. In such cases it is lost for statistical purposes under some such heading as "miscellaneous" or" other countries."

"Allow me to present as an illustration some facts of cotton and cotton manufactures imports from the official statistics of Argentina, the country having the largest cotton imports of any of the Latin American republics, amounting to nearly $35,000,000 per annum. Nearly one-half of this is from the United Kingdom, about six and one-half millions from Italy, over five millions from Germany, two and one-half millions from France, nearly two millions from Belgium, eight hundred thousand from Spain, and a little over seven hundred thousand from the United States. This is a bad showing, but the figures I give of gross amounts are not half so bad as is the actual condition when we examine the particular items going to make the total. Some of these items are:

"Cotton towels and toweling (in round numbers) $230,000; United States's share nothing; for five years the total amounted to less than $900. Cotton cloth, silk finished, with small percentage of silk mixed, over $900,000; United States's share $1,024; for five years it amounted to less than $2,000. Cotton cloth, with small percentage of wool mixed, nearly $1,900,000; share of the United States, nothing; for five years $85. Cotton cloth not otherwise specified, over $700,000; share of the United States $4,355; for five years less than $26,000. Cotton cloth, dyed, $10,800,000; share of the United States $15,740; for five years less than $38,000. Cotton prints, over $3,800,000; share of the United States $29,035; including this, for five years $36,586. Bleached cottons, $4,000,000; share of the United States $12,396; for five years $77,000. Unbleached cottons, $1,210,000; share of the United States, $50,906; including this, for five years less than $75,000. Handkerchiefs, $700,000; United States's share $18; for five years $6,165. Stockings $1,500,000; share of the United States $815; for five years $2,044. Spool cotton $627,025; share of the United States, nothing; for five years less than $10,000. All-cotton blankets and blankets with slight wool mixture, $100,000; share of the United States, nothing, and nothing for five years. Laces $1,400,000; share of the United States $916; for five years $7,370.

"What then are the cotton imports from the United States? Principally raw cotton, $72,682, out of a total of $86,826; bags $103,405, out of a total of $380,000; canvas and sail cloth (white) $130,662, out of a total of $180,000; canvas and sail cloth (colored) $42,474, out of a total of $185,000. In imports of raw cotton and of white canvas and sail cloth, the United States leads, and these are the only cotton products on the list of which this is true. In cotton bags and in colored canvas and sail cloth, and I may add candle wicks, of which of the last the total imports are $38,000 and the United States's share thereof $10,144, the United States is second.

"Bad as this showing is for the United States cotton trade with Argentina, the showing is much worse for all the other South American countries, with the exception of Columbia and Venezuela, where it is a trifle better. It is several degrees better still, though far from being good, for all of the ten countries of Latin America north of the Isthmus. For example, let us look at the cotton trade of Mexico, the country nearest to the United States and with which we have the best transportation facilities. In Mexico, cotton manufactures are grouped under three broad, general heads—thread and yarn, cloths, and ready-made articles. The total importation being $5,412,550, of which thread yarn and cloth together amounted to $4,078,070. Of this last amount the share of the United Kingdom was $2,651,533, Germany $376,293, United States $361,486, and France $235,035. The importation of spool cotton was

$875,610, of this the United Kingdom furnished $796,725, Germany $32,595. Belgium $28,033, and the United States $17,042. Cheap cotton laces, $608,982, of this the United Kingdom furnished $363,939, Germany $133,012, France $82,103, Spain $16,644, and the United States $7,403. The importation of cotton cloth, under fourteen classifications according to weave, was $2,068,306, of which the United Kingdom furnished $1,195,726, the United States $314,569, Germany $154,350, and France $128,523. In ready-made cotton goods principally underclothing, the United States makes quite a respectable showing, in some particular lines heading the list.

"It is a matter of surprise why the United States makes such a poor showing in cotton manufactures in Latin America, the nearest and from nearly every standpoint, for us the best market in the world. We produce two-thirds of the cotton, yet such countries as Italy, Spain and Switzerland, not to mention England, France and Germany, which manufacture from America cotton, far outrank us in the Latin American field.

"There is a reason for this, but perhaps not a good one. I recognize that no business man is going after a trade unless there is money to be made in that trade. It would be useless for me in my efforts to increase the trade of the United States with Latin America to stop short with showing you the enormous buying capacity of these countries and to tell you what your rivals the English, German, French, Italian, Spanish and Swiss cotton spinners are already doing in this field, unless I can convince you, members of the American Cotton Manufacturers Association, and other manufacturers, that here there is a profitable business for you. In any export business, the first simple primary fact to be considered is whether as a manufacturer you can place your goods on the market at a cost to you no greater than the cost to your competitors. Can you manufacture as cheaply as they can, or, if not, are there compensating advantages equivalent to difference in cost, or, on the other hand, if you can manufacture more cheaply, have your competitors compensating advantages which will more than offset your advantage in manufacturing cost.

"After all, who are your competitors in this foreign market? Are they home producers, or are they, like yourselves, foreigners?

"There are many factors to be considered before a confident answer can be given to some of these questions. As to costs of production and margin of profit required, the American manufacturer must answer this question for himself, and moreover each individual manufacturer will give his own answer. While I, or my staff of co-laborers in the Pan American Union, may be able to give you some valuable information as to the precise needs of the Latin American cotton goods trade, or how to pack and ship your goods or how to sell the same, yet I must assume that in all matters of manufacture and costs in general you are better informed than I am or can be.

"Where I can be of assistance to you is: First: In showing what the Latin American market is, i. e., what it buys, how much, and from whom. This I have briefly outlined above.

"Second: In showing the conditions under which one must operate if he desires to enter this market. These conditions group themselves under three heads—transportation, credits, and tariffs.

"In transportation the American cotton manufacturer enjoys a considerable advantage over his European competitor in freight rates. He will continue to enjoy this advantage so long as the main current of tonnage sets as it does at present and this will no doubt be for many years.

"Latin America, the United States and Europe form a shipping triangle. On this triangle the main current of freight, the tonnage, is up from South America to the United States, then from the United States to Europe, and then from Europe to South America. This current represents the high freights. The reverse current, much smaller in tonnage, represents the low freights. The greatest disparity exists on that arm of the triangle between South America and the United States. Here the north-bound freight is more than four times the weight or volume of the south-bound freight. Consequently freight rates from the United States to South America must under natural conditions remain low until the balance is restored. As compared with New York, the freight rates on cotton goods from Liverpool are higher to Havana by 40 per cent, to La Guaira by 92 per cent, to Buenos Aires by 143 per cent and to Calao by 56 per cent.

"Credits. Latin American merchants have been accustomed to longer credits than are usual in the United States. Six months and even more is not uncommon. I will not dwell upon this matter, since it has been so often and so well covered, except to say that Latin American credit is good, in fact there is no better, and that the tendency is towards shorter credit periods.

"Tariffs. Here I believe is the crux of the whole matter, the reason why our cotton manufacturers cut such a poor figure in Latin American imports. Freights are in their favor and long time bills are no serious obstacle, but tariffs —this is something at which the American manufacturer shies.

"The difficulty is not in the tariff itself, for the Latin American tariff is a quite harmless bugaboo when you come to know it well. The main difficulty is in the American point of view as to tariffs in general. It is in applying to an export trade what the American manufacturer has learned about tariffs as affecting foreign competition in his own domestic trade. The difficulty is further complicated by this unfamiliarity with the exporter's point of view as to any tariff.

"Now there is no parallel whatever between the Latin American tariffs as affecting the American or other foreign cotton manufacturer in the matter of his exports to Latin America and the tariff of the exporter's own country as affecting his domestic trade. Not only is there no parallel, but unless he is able to free his mind entirely from everything he has learned about tariffs in the latter trade he can never successfully compete in the former. The two sets of conditions are not only not alike, they are diametrically opposed. This is true whether the tariff of his own country and of the country to which he exports be both revenue or both protective tariffs, or whether the one be revenue and the other be protective. His chance of doing business, however, is influenced primarily by the extent to which the foreign tariff deviates from the protective principle and approaches a revenue standard. In Brazil and in Mexico the protective principle in cotton duties to a limited extent exists, but so limited and the industry in these two countries not yet being on a basis to supply domestic wants, it is scarcely necessary to consider protection from any standpoint as affecting the foreign manufacturer. With

these exceptions—in truth not exceptions—Latin American cotton duties are all on a purely revenue basis. This is the fundamental fact about which all other facts group themselves. It means that in no Latin American country is the foreigner in any line of cotton goods excluded. The market is open for all and for everything.

"Of course it is understood that the tariffs of these twenty countries differ widely one from the other. In some the rates are high, in others they are low. In some they are high on one class of goods and low on another, and *vice versa*, but they are all on a revenue basis. This being so and the value of the imports showing that even the high schedules do not to any great extent curtail consumption, it can be easily seen that the importance of the tariff is reduced to a minimum in so far as it affects unfavorably the foreign manufacturer. He may from this standpoint consider for all practical purposes the tariff as non-existing.

"But from another standpoint the tariff is of vital consequence. This standpoint I may call the technical, the bringing together expert knowledge of cotton textile manufacture and expert knowledge of tariff schedules and appraisements. The two are necessary, otherwise the tariff cannot be read intelligently, its pitfalls avoided and its opportunities taken advantage of.

The Pan American Union is constantly in receipt of letters of inquiry of this kind: What is the duty in Chile on cotton goods; or on unbleached cottons; or, sometimes, what is the duty in Latin America (twenty countries) on cotton goods (one thousand articles)? Such letters as this are the despair of the tariff expert, for here is someone who wants to know something and the Pan American Union is sure that it can help him if it knew just what was needed. It is worse than useless to send copy of tariff schedules, for *without appraisements*, these schedules are, in computing duties, misleading in the highest degree. Even if a sample of the goods accompanies the letter—and this it seldom does—our expert most often finds himself unable to classify the goods without that technical knowledge which only the textile expert possesses. There are twenty countries and appraisements are on a different basis in each of them. These bases are often contradictory and it has been humoriously said that what is an overcoat in one country is an undershirt in another.

"I will give you an example of how a tariff applied without understanding the importance of the appraisement can be misleading. An American manufacturer of knit cotton underwear hearing that the duty in Argentina on his line of goods was 40 per cent ad valorem and computing the 40 per cent on his factory price, to which he added freight and other charges, contracted on this basis to deliver in Buenos Aires duty paid a large bill of a certain kind of goods. When he came to pay the duty he found that instead of being 40 per cent on his factory price, it was 40 per cent on an appraisement of 2.45 pesos per kilo, i. e., 40 per cent of $2.38, or about 42 cents a pound. This was an expensive mistake and one that should not have been made.

"In another case a piano manufacturer was asked to quote a price on an extra fine grade of upright pianos in Argentina. The duty on pianos he ascertained to be 25 per cent ad valorem. His factory price on this grade was nearly $500. He quoted a price duty paid according to his own appraisement of value. As a matter of fact the appraisement of this particular piano in Argentina was less than $150, and in consequence he lost the sale. The French manufacturer who got the order was better informed and received a net price for his pianos more than the American thought he was offering his for."

The prominent mill architect and engineer, J. E. Sirrine of Greenville, S. C., then read an instructive and carefully prepared paper on "Modern Mill Construction." He was followed by George W. Neville, president of the New York Cotton Exchange, who presented an able discussion on "Cotton Exchanges, Producers, Cotton Merchants and Spinners." Mr. Neville said in part:

"In a gathering of this nature there are only two subjects to talk on, viz.: raw cotton and finished cotton goods. Nature has given us a large supply of raw cotton this season, and the moulders of feminine fashions have decreed that the ladies shall wear more yards of cloth in their garments, and as one of my friends with a mathematical mind figured the scanty attire of the fair sex cut out at least twelve yards of finished goods per adult female inhabitant of the civilized world, this scant attire cut a very large figure and was a contributing factor to the small demand for finished goods the past two years.

"Worthy of mention here is the enormous yield of cotton this season in the oldest cotton growing States: North Carolina, 1,152,000 bales; South Carolina, 1,722,000 bales; Georgia, 2,867,000 bales, and it may be of interest to some of you not conversant with the production of cotton in its details, that from 1791 to 1811 South Carolina and Georgia produced practically the cotton crop of this country. The yield of lint per acre in the states producing large quantities of cotton is still at its maximum in North Carolina and South Carolina, notwithstanding they are the oldest cotton producing states.

"With the increased acreage and larger crops, the increased spindleage in the South, the change from coarse to finer goods, and the inroads of the Mexican weevil in Louisiana, Mississippi and Arkansas, the development of staple cotton cultivation has been forced in the Atlantic states, and by seed selection and plant breeding South Carolina has surprised the cotton world this season by the production of 1 3/16 to 1 5/16-inch staple cotton, and we may expect to see a large production of this character of cotton the coming season in the Atlantic states.

"It was my pleasure to preside at a conference of representatives of your organization, the National Association of Cotton Manufacturers, and the New Orleans and New York Cotton Exchanges, to consider suggestions that the two spinning organizations wanted to make, and during the discussion it was plain that a good part of your antagonism to cotton exchanges was due to your not being familiar with the by-laws and rules and the economic functions of the cotton exchanges.

Cotton exchanges, to perform their true services to the entire cotton trade, must have their rules and by-laws such as will provide facilities to farmers of the South, through the cotton merchants, that will give a constant daily market for all merchantable and spinnable cotton that weather conditions enable the farmers to produce. It is wise, however, to have some limitations as to the lowest grade deliverable on a contract of sale for the future delivery of cotton, although I believe in giving a grade for every kind of cotton that is usable, in order that the farmers may have some way of determining the value of their product.

"The New York Cotton Exchange was organized and a

charter granted by the New York State legislature in April, 1871. The purposes of the institution are clearly set forth in the third section of its charter.

"The purposes of said corporation shall be to provide, regulate and maintain a suitable building, room or rooms, for a Cotton Exchange, in the city of New York, to adjust controversies between its members, to establish just and equitable principles in the trade, to maintain uniformity in its rules, regulations and usages, to adopt standards of classification, to acquire, preserve and disseminate useful information connected with the cotton interest throughout all markets, to decrease the local risks attendant upon the business, and generally to promote the cotton trade of the city of New York, increase its amount and augment the facilities with which it may be conducted, and to make provision for the widows and families of deceased members. The said corporation shall have power to make all proper and needful by-laws, not contrary to the constitution and laws of the State of New York or of the United States.

"The grades deliverable on contract against a sale for the future delivery of cotton ran from good ordinary to good middling, with low middling as the basis grade, but after the American Standard Classification was made, on September 1, 1874, the New York Cotton Exchange, in adopting this classification, took middling cotton as the basis for trading in cotton for future delivery, effective September 1, 1875, and the other cotton exchanges shortly after adopted the same limitations.

"Your organization has been very urgent to make the lowest grade deliverable on contracts low middling. To do this would be treating the farmers of the South unjustly, and as each contract for 100 bales of cotton traded in on any cotton exchange calls for the delivery and acceptance of 100 bales of cotton, all cotton exchanges should provide for the acceptance on contracts of purchase and sale of all merchantable cotton raised by the farmers of the South. There are seasons when the qualities of cotton produced are such that there are very few bales of grades below low middling, and when this occurs you have a low middling contract; but there are seasons (this one, for instance) when, for some reason, the qualities below low middling are superabundant, and the facilities of the cotton exchanges, in justice to the bale of cotton, should provide a constant daily market for such grades. The lowest grade deliverable on contract is good ordinary, and this is a good spinnable, grade, usable in every mill where yarns or goods are dyed or printed.

"Cotton exchanges represent the evolution of the trade of the cotton merchant, who distributes the cotton as the farmer produces it and supplies you gentlemen with the qualities you require to make the special lines of goods you manufacture, and, by the way, you gentlemen all seem to think the farmer produces nothing but strict middling cotton. The other grades which the farmer has to sell and the cotton merchant has to buy, to get you your strict middling, have to be taken care of, otherwise the element of speculation on the part of the cotton merchant would be so great that the merchants, having to do with the distribution of the cotton from farmer to spinner, could not buy from the farmers as freely as they do now, because the risk of fluctuations would be greater than the margin of profit that exists today. The evolution of this feature of the business developed the cotton exchanges, where buyers and sellers meet and trade in contracts for the future delivery of cotton. The New York Cotton Exchange was organized primarily by the cotton merchant, for his protection against price fluctuations, and here I wish to take issue with my learned predecessor in his statement that it was created for the cotton merchants alone. Cotton exchanges provide facilities for all cotton interests, whatever may be the lines of their endeavor, and the investor, as well. The membership of the New York Cotton Exchange today embraces merchants residing in practically all of the cotton producing states, bankers, spinners, and some engaged in planting cotton. If cotton manufacturers only sold their goods when the cotton was being marketed, and the farmer only marketed his crop when the mills sold their goods, there would be no use for cotton exchanges; but, gentlemen, this is not or never has been the method of the business. You gentlemen have opportunities of selling the product of your mills for many months ahead, at a time when there is very little cotton being marketed, and to buy this cotton (if it existed), warehouse, insure and borrow money to carry it until you could convert it into finished goods or yarn, would enhance the price to such an extent that your over-sea competitor, by using the Liverpool contract market, would get the business. Consequently, you either buy contracts for the future delivery of cotton on some cotton exchange, or buy your exact quality from some reliable cotton merchant and he in turn buys contracts for the future delivery of cotton on some cotton exchange, to protect himself against price fluctuations, depending upon the price at which he sold you your quality, to give him his profit. This method fixes the cost of your raw product when you sell your goods, without depreciating the price to the producer.

"The New York Cotton Exchange does not trade in contracts for the future delivery of cotton. The members of the New York Cotton Exchange in New York trade on the floor of the New York Cotton Exchange in contracts for the delivery of cotton, both for immediate delivery and for delivery in the future on the basis of middling. This is necessary, as at the time when large business is possible with you, the quality nor quantity of the crop is not ascertainable, and the basis middling contract has to be broad enough to take care of all merchantable cotton raised; and, through the Inspection Bureau of the New York Cotton Exchange its members accept delivery of cotton against a purchase of contracts for future delivery, good ordinary to fair, low middling tinged to strict good middling tinged, and middling stained, provided it is merchantable cotton, which is defined by section 42 of the bylaws:

"Merchantable cotton shall be understood to be cotton as gathered upon the plantations of the United States, ginned with the usual machinery and with customary care, and showing no indication of fraud.

"Unmerchantable bales which shall invariably be rejected—shall be understood to include false-packed bales, bolley, threshed, or machined cotton, and bales that show an excess of seed, sand, or dirt, rebaled cotton, bales that have been on fire, or any other bales not conforming to the above definition of merchantable cotton, it being the intention of this section that only the regular run of cotton, as picked from the fields of the cotton states of the United States, shall be considered merchantable.

"All cotton submitted for delivery is inspected on the docks by employes of the Inspection Bureau, and as bales are accepted they are given lot numbers, such lot numbers having a letter to denote the warehouse system where the

cotton is stored. The samples are then taken to the classification room, each sample broken in three parts, one part aired for twenty-four hours, the second part put away and kept by the Inspection Bureau during the life of the classification certificate, and the third part is delivered to the merchant offering the cotton for inspection. The original is then classed by two members of the Classification Committee, and this Committee is not permitted to engage in any other business. The Inspection Bureau of the New York Cotton Exchange guarantees to the holder of a grade certificate the grade mentioned in this certificcate, under rules to this effect. Each 100 bales of cotton, or 50,000 pounds, has to be covered by warehouse receipts and grade certificates bearing the same warehouse letter, and no delivery is deemed as in fulfillment of a sale that has warehouse receipts bearing two different warehouse letters, and the party attempting such delivery is penalized heavily.

"The present management of the New York Cotton Exchange has under consideration certain changes in the system of inspecting and certificating of cotton, that will in our opinion facilitate the delivery, the acceptance and shipping of cotton from the warehouses in New York. The classification in use by the New York Cotton Exchange is the American Standard Classification adopted by the national Cotton Exchange in June, 1874, whose membership embraced all cotton exchanges then in existence in the United States.

"The government Standard Classification, to be complete, should have standards made from Upland or Atlantic states cotton, which cotton is the basis of all traded in for future delivery on all cotton exchanges and is the quality quoted in all markets the world over where American cotton is bought or sold. The New York Cotton Exchange has been criticised and threatened for not adopting the Government standards. We are willing to meet this criticism and have no fear of the judgment of cotton people in the position we have taken on this question. We have always stood for uniformity in classification, but just for uniformity's sake we are not going to adopt a standard that does not represent the quality of cotton traded in on any cotton exchange in the world, for the future delivery of cotton, or that does not represent the character of cotton quoted daily in all cotton markets of this country and Europe."

An additional paper presented was "The Lancashire Cotton Trade," by J. M. House, commercial agent of the Department of Commerce and Labor. As Mr. House was still in Europe, the paper was read by title only.

Adjoining the convention hall on the tenth floor of the Raleigh was an exceedingly interesting exhibit by the Bureau of Manufactures Department of Commerce and Labor, consisting of hundreds of samples of cloth of different constructions from Europe and Asia, duly marked as to construction, country where made, etc. These samples have been collected and sent in by the commercial agents of this department. It was an exhibit that was thoroughly appreciated by the members and guests of the Association.

In the absence of the chairman, A. A. Thompson, Secretary Bryant read the report of the committee on bills of lading, which was accepted and the committee ordered continued. This was followed by the reading of the annual report of the secretary and treasurer.

Joseph Newberger, of the Newberger Cotton Co., of Memphis, Tenn., was then asked by President Smith to address the convention on "Tare, Weight, Allowance, Patching and Bagging." This paper was prepared after the program of the convention was issued. Mr. Newberger's address was received with interest by the members.

The social event of the convention was the reception tendered the Association by President Taft. This was held in the East Room of the White House. After exchanging personal greetings with the members, President Taft said in part:

"We are in this country in respect to every business on a protective tariff basis. I do not mean that every business needs a protective tariff to enable it to live, but I mean that there are so many businesses that are dependent on a protective tariff that they may live; that to take away a protective tariff from them would disturb the whole business foundation of the country. Therefore, it is essential that when we, who are charged with authority as to the adoption of laws and the formation of tariff bills, attempt to amend them, we should know that we are touching the business of the country and probably affecting its prosperity.

W. A. Erwin, President-Elect.

"I have no doubt I am looking on men here who can live through hard times and be comfortable, but the people who suffer from a lack of prosperity, who suffer from hard times, are the wage earners and the poorer people in the community. It is they who need prosperity in order that their children may have shoes, good meals, live well and be educated. What I wish to emphasize is that it is the business of the Government where it attempts to amend, to change, or to revise a law that affects the business of the country, and affects it most intimately in such a way that it may cause disaster to business—it is necessarily the duty of the Government, and by that I include all branches of the Legislature, the House, the Senate, and the Executive, for he plays some part in legislation—to inform itself as to what the law which it is proposed to pass is going to do with business, and that to adopt a law without understanding whom it is going to injure and whom it is going to help, is not statesmanlike.

"We are not all born to be cotton manufacturers, and what we don't know about cotton manufacture will fill a great many books; it is not right that we should treat the industries of this country without an intimate knowledge derived from expert information as to what the effect of these laws will be which we propose to pass revising the tariff, which so much affect the business and the business prosperity of this country.

"I am in favor of a tariff board composed of experts who will give everybody an opportunity to be heard, and then will make up its mind as an independent quasi-judicial tribunal and make its report to Congress. That is what I am in favor of, and I hope it strikes the business men as a useful thing to do, to know where you are going to put your foot before you put it down, in order to calculate what the effect may be.

"Of course, it is said by some, why it is only for the purpose of raising revenue anyhow. It is not to be directed to helping along artificially any industry if this theory is ultimately passed upon. It is easy enough to write a law of that sort. That is the simplest kind of a law to write, but if you are going to treat the industries that exist with a cherishing hand, so that they may continue to exist, and you believe in diversified industries, in order that we may have this country able to meet every requirement within the country itself, in other words—if you are in favor of a protective tariff, then we must know what we are going to do when we come to revise the tariff, and we ought not to go about the work with blacksmith's tools and hit here and hit there without understanding what the effect of each blow may be."

As soon as President Smyth called the meeting to order on Thursday morning, Mr. Cone, of Greensboro, N. C., introduced an unannounced speaker in the person of Joseph Fels, the well known soap manufacturer of Philadelphia and London. Mr. Fels made a short but pithy talk on the subject of "Untaxing Business." He advocated the removal of not only the tariff tax, but of all taxes except the tax on land.

The regular business of the meeting was then taken up. The annual report of the statistical secretary was read and this was followed by the report of the joint committee on cotton exchanges as presented by their chairman, Lewis W. Parker. Then came the report of the committee on resolutions consisting of J. D. Hammett, Eugene Holt and Franklin W. Hobbs.

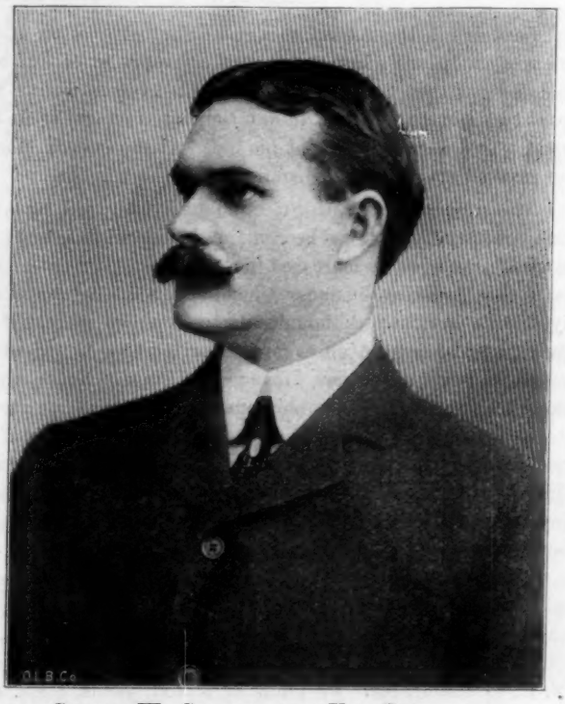
One of the most pointed of the resolutions, however, was that thanking Secretary Nagel for the interesting and address delivered by him before the convention and trusting that the work of the Department of Commerce and Labor would be promoted and enlarged for the general benefit of the commercial interests of this country.

This resolution was evidently intended to apply to certain rumors that Congressman Burleson of Texas was making an effort to have the Bureau of Manufactures removed from the jurisdiction of the Department of Commerce and Labor and connected with the Department of State, and at the same time eliminate the special commercial agents of the present bureau, who are accomplishing such a great work in our foreign export field.

The report of the committee on tariff and other legislation was read by Chairman R. M. Mitter, Jr. After reviewing the work accomplished by the committee during the past year, the adoption of the following resolution was recommended:

First: This Association at its May, 1909, meeting, recorded itself as favoring the establishment of a Tariff Commission and now reaffirms that action.

Second: It now appearing from the preliminary synopsis of the report of the Tariff Board and from other investigations, that in some instances duties on cotton goods are now excessive, owing to changed conditions in manufacturing.



STUART W. CRAMER, NEW VICE-PRESIDENT.

Therefore, Be it resolved, That this Association records itself as favoring such reasonable revisions of the cotton schedule, based upon differences in cost of production and other conditions at home and abroad, as shall be consistent with the raising of revenue and the conservation of our home market.

"Personally and on behalf of the committee," continued the chairman, "I desire to acknowledge our obligations to Mr. Cramer, a member of this committee, for his special interest in the work of the committee. His services were invaluable to me as chairman and his time was always at the disposal of the committee. This acknowledgment the committee feels is due him, and requests that the same be embraced as a part of this report."

Under the head of new business a committee of two were elected to present to Secretary Bryant some suitable emblem as an expression of the appreciation of the Association for the good work he has accomplished.

The nomination committee consisting of A. J. Draper, Elias Richards and T. E. Moore, then made its report, and the following officers were unanimously elected:

President—W. A. Erwin.

Vice-President—Stuart W. Cramer.

Secy. and Treas.—C. B. Bryant.

To fill vacancies on the Board of Governors:—James P. Gossett; A. Markepeace; W. C. Ruffin; J. T. Broadbent; and T. I. Hickman.

The convention then adjourned, closing one of the most enthusiastic and interesting meetings in the history of the Association.

Mill Conditions and Market Reviews.

SOUTHERN MILL SITUATION.

(Special Correspondence.)

Last month the market change in Southern cotton goods market conditions was noted in this correspondence. It was pointed out then how the situation had reversed during the past two months and that to-day the manufacturer is in the saddle, and has the buyer at his bid. At the end of March no marked change in that condition has been made.

The upward trend of prices in practically all lines of fine goods and yarns, has been maintained, and in several instances prices have increased perceptibly. The mill man is to-day enjoying business which begins to border closely on the normal. Although raw cotton has increased in price, there has been an even greater increase in prices of goods and manufacturers are now refusing business which does not show a considerable degree of profit.

Some forward business has been put through. In fact numerous spinners are reported to have sold ahead through June, July and a few on into September. There seems to be a general disposition, however, to make no long time contracts unless price offerings are particularly inviting.

The mill building record for the month has kept pace with that of February. The Cannons, of Concord, are arranging to establish a large waste mill at Kannapolis, N. C. Charter has been granted the Dorothy Mfg. Co., of Lowell, N. C. to manufacture all kinds of cotton, yarns, cloth, etc. Capital stock is $250,000 authorized with $40,000 subscribed. The Highland Park Mfg. Co., of Charlotte, has announced that they propose to spend in the neighborhood of $75,000 to $100,000 on extensions to their plants. Sixteen thousand spindles will be added to their mills. No. 1 located in Charlotte, and No. 2 at Rock Hill, S. C.

The government's report on "horrible" mill conditions in the South, notably at Atlanta, and Burlington and Greensboro, N. C. has caused not a little comment. This sort of sensation was frequent several years ago when writers were sent South by muckraking magazines to find "white slavery," "horrible conditions," etc. The writer has seen only an extract of the government's report. The full report may show less ignorance of the real situation. As a matter of fact, cotton mill conditions in the South are anything but horrible. It is possible to find an exceptional case of poverty and ignorance in an occasional mill settlement, as it would be to find the same in the slums of any of the cities, but mill men here express displeasure that the exception should be held up as the rule. At Greensboro where one of the horrible examples was spotted the Cones, extensive manufacturers of cloth, annually donate thousands of dollars to their operatives. They have spent many thousand dollars in years past in beautifying the mill villages, and making the home life of their employees more attractive. The same has been true at Concord, Durham, Charlotte and other Carolina mill centers, as in other mill settlements of the South. Speaking of the report, J. W. Cannon, of Concord, N. C., head of twenty large mills in the South said:

"Labor in the mills in the South, is, as a rule, contented, prosperous and happy with school facilities, as well as the conveniences and even the luxuries of life if they can afford them.

"This hue and cry which has been raised is, in my opinion, unworthy of the slightest attention. Those who are so violent in their denunciation of labor conditions in the Southern mills, when traced back, are usually found to be self seeking demagogues, fanatics and that class of people. I believe that the South and Southern laws are amply adequate to cope with the situation even if the mills do not want to do so, but it is to the interest of the mills to conduce in every way to the pleasure and profit of their employes. Recreation halls are built, and in many cases the Y. M. C. A. is put in charge of a certain person who has practically unlimited power to contribute to the amusement of the help when they are off duty. The state laws govern the age of those who come to work, as well as the hours they shall work, and there are no self respecting mills that would transcend these laws. The only investigation that I have made of this trouble has pointed toward the teachers and self made reformers. I have described them already. I believe the conditions of the mill laborer in the South are on as high a level as that of any country in the world, as everything is done that can be done to elevate their moral, social and interlectual being."

The plans, announced some time ago by which the Dukes hoped to find a market for American goods in China, are somewhat similar in nature to those suggested by Maj. John M. Carson, special agent of the Department of Commerce and Labor, who has been investigating conditions in China, Japan and throughout Asia for many months past, and who has just visited Charlotte, N. C., to confer with spinners. The Dukes proposed to establish throughout China fifty cloth depots. These depots would be in charge of experts in their lines. A special study would be conducted on the ground, the idea being to ascertain just what kind of goods the trade required, how those goods should be cut, and wrapped to best advantage, and other details of that nature. In short, to follow up in opening markets for Southern made cotton goods, the policies pursued in making markets for tobacco. Maj. Carson gave out an interesting interview while in Charlotte on the needs of the day for extending American cotton goods markets.

He is in the South investigating closely the situation relative to the baling and handling of cotton, with the idea of making a recommendation to the Secretary of Commerce and Labor which will save to the American cotton planter at least $5,000,000 annually. This is represented by the loss of four pounds per bale between the planter and the spinner.

His findings are being given to the American manufacturer with the idea of enabling them to overcome the difficulties which have heretofore existed, and which have given the manufacturers of England preference in these markets. Maj. Carson points out that the American manufacturer knows little or nothing of the demands or needs of the foreign markets, and that to manufacture goods which will find ready sale in those countries, they must make a study of climatic conditions, as well as the customs of these various countries, and weave such fabrics as can be most readily

converted to use by these people. He ascribes a considerable amount of the loss of American cotton in the bale to the poor method of packing which shows it to a marked disadvantage when compared with cotton from other sections of the world. He recalls instances on the Liverpool wharf where American cotton of the same staple brings a cent a pound less than the cotton properly baled from other countries, and declares that a little attention given to this feature will result in enormous dividends to American exporters.

Maj. Carson's study of foreign markets has shown him that total exports of cotton goods from the United States in the census year of 1909 totaled only $130,000,000, as against nearly $600,000,000 exported by Lancastershire and ascribes the superiority of the English market over the American product to the care with which the Britisher studies his market, and weaves such fabrics as there is a demand for. The British manufacturer maintains a series of warehouses throughout the world which serve as the base of supply for the furnishing of merchants, and this further assists the English manufacturer in disposing of enormous quantities of cotton goods, while the American manufacturer knows nothing of the demands of his market and has no supply to draw from except in the home mill. The establishment of warehouses similar to those maintained by England would put the American manufacturer more nearly on the same basis, and a close study of the needs of the various kinds of people, to whom the goods would be sold ultimately, would result in increasing the exports hundreds of millions of dollars. American manufacturers have been able to find a market for the bulk of their product in the United States, which is the result of wise legislation which has prevented the imports of fabrics produced at a lower cost, to compete with the American mills. The consular department of the American government is devoting a great deal of time and study to the details of these conditions, and this information so gained, is being disseminated through confidential reports to American manufacturers, and it is the opinion of Maj. Carson that a careful study of this information, and action along the lines suggested, will do much to turn the balance of trade in favor of American mills.

E. A. Smith, of Charlotte, N. C., one of the best known manufacturers in the South, has purchased the entire holdings of the Charles A. Hiss Estate of Baltimore, Md., in the Rhodhiss Mfg. Co., Rhodhiss, N. C., and after having given most careful consideration to a large number of suggested locations, has finally decided to locate his new mill, which will be built by the E. A. Smith Mfg. Co., at Rhodhiss. The site selected for this mill is on the Burke County side of the Catawba River.

Rhodhiss is located in the foothills of the Blue Ridge Mountains, and embraces parts of both Burke and Caldwell counties. The town has the advantage of an excellent water power, and is supplied with adequate railroad facilities by the Carolina & Western Railroad. Mr. Smith being desirous of locating his mill on a water power, has displayed his usual good judgment in locating at Rhodhiss.

Co-operating with Mr. Smith in The Rhodhiss Mfg. Co. and the E. A. Smith Mfg. Co. will be C. S. Child of Philadelphia, Pa., and W. J. Fullerton of Ridgewood, N. J., (who constitute the firm of Wilson & Bradbury, well known Dry Goods Commission Merchants of Philadelphia and New York); John M. Miller, Jr., vice-president of the First National Bank, Richmond, Va.; Robert Lassiter, president and treasurer of the Middleburg Mills, Batesburg, S. C., and treasurer of the Oconee Mills Co., Westminster, S. C.; Walter S. Taylor, secretary of the Rhodhiss Mfg. Co., Rhodhiss, N. C., whose residence is in Charlotte, N. C.

A meeting of the E. A. Smith Mfg. Co. was held in the private office of Robert Lassiter in Charlotte on March 18th and the following organization was perfected: Directors—E. A. Smith, C. S. Child, John M. Miller, Jr., W. J. Fullerton, Robert Lassiter, Walter S. Taylor and Geo. B. Hiss. At a subsequent meeting of the directors the following officers were elected: E. A. Smith, president and treasurer; C. S. Child, vice-president, and Walter S. Taylor,, secretary. All of the officers and directors were present at the organization meeting.

Building and machinery plans have been prepared by the Shand Engineering Co., of Columbia, S. C. The mill will be operated by wate r power, direct drive, and will be equipped with 15,000 spindles and 450 looms, making export and domestic sheetings and drills.

Contracts have been made with Howard & Bullough American Machine Co., Pawtucket, R. I., for pickers, cards, drawing and roving machinery, and with Fales & Jenks, Pawtucket, R. I., for spinning machinery.

So quietly, though determinedly, has Mr. Smith been working on the details of his plans, that but very few of his large circle of friends and acquaintances have been cognizant of the ideas he has had under consideration, but during the past ninety days, he has with his customary persistence, worked out in complete detail one of the best cotton manufacturing propositions ever undertaken in the South, with the entire authorized capital stock of $300,000, fully subscribed.

CARD OF THANKS.

Editor Cotton:

On looking over the diary of my recent visit to the States, I find my obligations in the matter of hospitality so overwhelming that I must crave the courtesy of the columns of your influential journal for my letter of thanks.

From North to South, and East to West, every American citizen that I met appeared determined that my welfare should be his personal concern. As a newspaper man I am deeply grateful to the newspapers for the help they gave. Their publicity put me in touch with the people who could give me the information I wanted. The cotton men, too, took the greatest pains to give assistance. Even where their interests stood to be injured if we got all our own way with the cotton, they explained that they didn't like our scheme, but they'd see that I had all the help I wanted. And I had. Introductions, invitations, advice how to save money on the trip, and how to spend it, poured in on me from all quarters. I went aboard the Olympic with a sense of the deepest obligation to the many friends whose kindness and help I most gratefully acknowledge.

Yours faithfully,

For the MANCHESTER GUARDIAN, Ltd.

(Signed) Arnold L. Hart.

Lingerie goods were imported into Egypt during the first three months of 1911 to the value of $725,000. This trade has been growing rapidly.

NEW ENGLAND MILL SITUATION.

(Special Correspondence).

The New England mill situation has undergone a striking change in a few weeks. The mills are now generally well under order for some time to come, sharp advances have been made in many lines of goods, and general wage advances have been forced in woolen and cotton mills. The improved measure of employment has extended to bleacheries and finishing plants, and some fair sized orders have begun to come forward for new equipment. Taken altogether, the prospects are good for an active summer.

The canton flannel mills whose goods were opened for fall about March 11, are virtually sold up until August 1, and deliveries beyond that date are to be had only "at value." The leading napped goods mills have all the business they will accept for delivery before October and they have refused considerable business that has been tendered. The cotton blanket mills are employed in full. There was a short strike at the Beacon mills in New Bedford, but it was satisfactorily adjusted.

The Pepperell mills are sold ahead on their standard drills for export shipment to August 1 and have declined tenders of large business beyond that date. The business booked for India this year is stated to aggregate not less than 15,000 bales and is the largest done in several years with that section. Drills and sheetings for converting and jobbing purposes are very well sold ahead, some brands being under order for delivery through June. Scarcity in primary markets has been pronounced and sharper price advances have not been made because there have been no additional goods to sell. The mills have been troubled about getting all the skilled help required.

The culmination of the long labor strike at Lawrence was an advance in wages, and at this writing, Fall River operatives, through their unions have declined to accept a five per cent advance and have asked for 15 per cent. It seems probable at this time that a compromise will be made on ten per cent but this is not official. The effect of the wage compromise in woolen mills at Lawrence by which operatives were given advances varying from 5 to 12 per cent, threw the burden of advancing wages upon cotton mills. Northern New England mills met the situation by giving a voluntary advance of 5 per cent. Southern mills have not yet arranged a satisfactory schedule. A strike at Fall River or New Bedford is not looked for. The Rhode Island and Connecticut mills will advance in the same proportion decided on at New Bedford but at this writing manufacturers do not expect to advance more than ten per cent.

The wage complications became acute in the mill centres at about the time that a very sharp increase in the demand for goods came forward in the New York markets. There being every promise that coal and other costs of production would be forced up by conditions beyond the control of mill men, merchants were compelled to make advances in prices for late delivery goods and to turn down considerable business until mills and agents could agree upon a safe value basis on which to proceed. Business came forward so steadily in the latter part of February and the first week in March that agents had sold ahead in a larger way than they realized. Undoubtedly their calculations were set adrift by the slow way in which mills went into operation after the long period of irregular running due to poor trade. Some of the mills have as long a sold to arrive list at this moment as they had in the early part of 1907.

Fall River has sold more goods than it has produced for several weeks in succession and prices have advanced to a basis of 3⅝ cents for regulars and 4 13/16 cents for 38½-inch 64 x 64s. Substantial sales of 27-inch 64 x 60s have been made for delivery as late as November at 3¼ cents and the last open quotation on this construction was 3⅜ cents. Four yard 80 squares have sold at 6⅞ cents and 68 x 72s at 5¼ cents. Some of these prices represent advances since the first of the month of ½-cent a yard. Fine goods from combed yarns have not shared the same measure of improvement. There have been many orders accepted but many more have been declined because of the low bids made. Poplins, voiles, shirtings, silks and cottons, and other fine goods have been ordered more freely from the mills than in a year past, yet the trading on lawns has been of comparatively small volume.

The largest sales of staple prints and percales that have been made in five years are now booked. It is stated that the American Printing Company has $5,000,000 worth of business booked ahead, while the Algonquin and Pacific works have also booked a very large trade. Prints have been sold for export in the largest quantities known to the trade, some orders having been in 1,000 case lots. The price of standard staple prints was advanced to 5 cents and wide prints ½ cent a yard.

Standard staple ginghams are held at value by the Lancaster and Amoskeag mills and both corporations are known to be sold farther ahead on these goods than at any time in five years. Jobbers were anticipating a break from the basis of 6¼ cents for staple ginghams early in the year and when they realized that the break was not coming and that goods were scarce, they plunged on goods to arrive.

The lower count dress ginghams are very well sold, new fall lines which were opened last month having been ordered freely. But the business on the finer ginghams to job around 9 cents has been comparatively light. A good business has been done on 32-inch dress ginghams and shirting chambrays. The Everett gingham mills at Lawrence were closed on January 14 and not opened until March 18, so that the production of this large concern being out of the market has accentuated the scarcity.

Bleached cottons have been very active and all the bleacheries have been pushed for prompt deliveries. Fruit of the Loom goods have been advanced to 8 cents and are held at value at that figure. All lines of Lonsdale and Berkeley goods are sold ahead, the finer counts having been advanced ¼ to ½ cents a yard. Wide sheetings, pillow tubings, and similar merchandise have been advanced and there are orders on the books that will not be completed before August.

The heavy colored goods were advanced by leading mills about ½ cent a yard. Denims have been sold ahead into July, and in a few cases well forward to October. Cheviots, colored duck, pin checks, and similar heavy colored yarn fabrics are well under order through the summer. Stark crashes were advanced ½-cent a yard and are sold as far ahead as the mill will accept business. The market on tickings is very firm on a basis of 12¾ cents for ACE goods and fancy effects in tickings are very scarce. The best

known line of staple 8 ounce goods is under order for three months while other staples used in the jobbing trade are considerably behind in the deliveries desired. Much of the shortage has been brought about by the constant moving forward of shipments by jobbers whose business has been expanding faster than they provided for and by the placing of orders in excess of current production.

The delay in the improvement in fine dress cottons can be traced directly to the fact that the styles of dress worn do not call for a large yardage nor for the fine sheer printed fabrics. On cloths that are in style, such as piques, poplins, welts, voiles, and other goods, the business has been active for spot delivery. Some mills have contracts enough until July for their wide looms but narrow looms are not yet well taken care of. A very large business has been turned down on account of low prices.

The fine goods mills are facing a difficult problem in the matter of getting staple cotton of the required grades. Some staples are not to be had in satisfactory quantity at any figure, while others can be secured, so far as length goes, but not in the matter of strength. The long staple cottons now available grade low in breaking strength in the yarns and many mills will be forced to decline business on certain cloths because of an inability to get cotton of the grade and quality required. Nor is it clear that long staple cotton is going to be plentiful for some time to come. Certainly there is a much broader need for long staples than there ever has been before, yet the mills cannot get what they want.

The mills of New England as a whole have been buying cotton steadily and will continue to do so for the balance of the season. For this reason, very few spinners have any thought that the actual cotton will be lower in price, and most spinners expect it to be higher in July than it is at the present time. At the present moment the mills are in more general operation than they have been for nearly two years and the prospects seem bright for steady operations, despite the unsettling influences that may come with political and tariff agitation.

The bleacheries and finishing works have been pushed hard for prompt deliveries of staples and fancy goods. The large forward orders that have been seen in some years have not yet accumulated but they are coming in rapidly and some concerns are running at night trying to meet requirements for the summer distribution. The domestic lace plants have been very busy. It is a big lace year and fashion has aided the new domestic factors in finding a ready market for anything they offer.

There has been more business stirring with the machine shops in the past two weeks than at any time since textile tariff agitation began in 1909. Orders that have been withheld pending a revival of business have been placed. Southern enterprises having sprung up in several directions. The larger plants that were running but four days a week with greatly reduced forces are now more active than they have been in a year and while they have not secured the business that warrants them in looking far ahead, they are getting more trade than they anticipated a month ago. Prices are low, particularly on ring spinning and on cards, and some orders have been taken for occupation purposes largely. At the same time the outlook is decidedly better, and two or three of the leading factors have said within a week that the corner has been turned and improvement will now be rapid.

MONTHLY REVIEW OF THE COTTON MARKET.

(*Contributed Exclusively to* COTTON.)

BY H. AND B. BEER, NEW ORLEANS.

The sustaining feature of the market of late has been unfavorably cold, wet weather in the cotton belt, particularly in the central and eastern portions of the cotton region where preparations for the next crop are said to be backward, not so much compared with the normal as with last year's early start. While the rains have been alternating, they have not been excessively heavy, and it is probable that they have been exaggerated. Nevertheless, sentiment has been influenced to a considerable extent by highly colored reports from the interior telling of the unfavorable outlook for the next crop in the Mississippi Valley and South Atlantic states, the claim being made that very little in the way of plowing has been done so far.

In connection with present conditions in the central and eastern portions of the belt we have the following from Vicksburg, Miss., under date of March 11th.: We telegraphed you Saturday about the rainfall in the Delta for January and February, and as a matter of market interest, we now suggest that you examine the Government's second monthly bulletin showing temperature and precipitation for January and February of this year. The great number of cloudy days and the frequent rains naturally gave the impression that we had an extremely wet January and February, but this is not true at all. The Government's figures show that not only in the western belt, but also in the central part of the cotton belt, the actual precipitation for the first two months of 1912 was below the normal. At Vicksburg, where many complaints of bad weather have originated, the precipitation was approximately 2 inches below the normal in each month. At Memphis it was nearly two inches below the normal in January and about three-fourths of an inch in February. In the territory about Montgomery, Ala., the January rainfall was considerably above the normal, but the February rainfall was normal, and at Anniston and Birmingham there was little variation from the normal, except that in February Birmingham had about one inch less than usual. Even in the South-east we find that the rainfall about Atlanta and Macon for the two months was practically normal, both in January and February. In view of these statistics we think it is foolish to argue that the ground is watersoaked. On the contrary, there is very little water in the fields and the situation is such that two or three days of clear, warm weather would put the soil in excellent condition for plowing, even where drainage is poor."

As regards the new crop outlook in the Southwest, will say that it was never more favorable, especially in Texas where farmers are well up with their work, and where there is the best season in the ground for many years past, the total average winter rainfall, December, January and February, amounting to 7.56 inches, against 5.46 inches last year, 4.92 inches year before last and the normal of 5.75. Last year's Texas crop, about 4,250,000 bales was the largest on record by about 200,000 bales. This year the good season in the ground and fine condition of the soil, owing to the severe cold winter, and which has almost exterminated insect pests, makes the outlook very favorable for a large yield.

Regarding the acreage, there will probably be some little decrease in the South Atlantic states and Alabama, if any change an increase in Mississippi and Oklahoma, little or no change in Texas owing to the opening of new land offsetting reductions in the older sections of the state, whilst Louisiana will probably show a good increase, as it has been proved that cotton can be profitably raised despite the presence of the weevil, and planters prefer growing cotton than sugar, especially since the latter is threatened with a removal of the duty, which would virtually reduce the price to the cost of production. Under the circumstances we do not think there will be much of a reduction in the acreage of cotton this year.

Meanwhile the movement to market continues on a record breaking scale, and will probably continue to run relatively as heavy when compared with arrivals of one year ago during balance of the season, as on the basis of a crop of about 16,000,000 bales, the South has yet to market about 2,733,000 bales compared with 1,546,000 last year.

THE KNIT GOODS MARKET.

The knit goods market for the past month has as a whole shown considerable improvement. There were times when the demand seemed to flatten out and the amount of business transacted was small, but taken as a whole, the situation is brighter and the business outlook better than for sometime past. Jobbers are busy making spring deliveries and a moderate initial business is coming in all the time. It is expected that when the duplicate trade commences to come in in April, that with favorable weather, there should be a heavy reorder business. There are rumors that in case the reorders are strong that there will be a shortage of desirable merchandise because of the manufacturers curtailing production and the small amount of stocks now in retailers hands. The presidential election has in a large extent been discounted by the retailer and as a result the usual adverse effects of the presidential year is lacking.

The hosiery situation in the early part of the month showed improvement and there was a good demand for desirable lines. The underwear situation was stronger and manufacturers seemed to be gaining confidence. Price advances were fairly general and included nearly all lines. While considerable difficulty was experienced in getting spring deliveries on late orders, there seemed to be little complaint regarding the majority of deliveries on orders that were received earlier in the season. The rising market seemed to be producing good results and was in a way stimulating buying. Lines of women's low priced cotton ribbed vests to retail at 25 cents were marked up from five to ten cents a dozen and while there was not a large amount of business transacted, these prices were firmly held. Cotton hosiery lines are moving steadily for spring and summer requirements and the outlook promised a shortage in the near future. Desirable supplies of spring hosiery were decidedly limited and many predicted that there would be a scramble for goods a little later. Better grades were being taken in both cotton and silk hosiery, and retailers are learning by past experience that it does not pay to handle a line of goods that will show the consumer absolutely no return for the money expended.

The best feature of the hosiery market during the middle of the month, lay in the satisfactory volume of duplicate orders received. This was putting an entirely different face on the outlook as far as some mills were concerned. The high prices of cotton yarns were to some extent detrimental to the hosiery trade inasmuch as it caused the manufacturers to advance prices and thus interfered with many orders that were on the point of being placed. The underwear market also showed a fair volume of duplicate orders on spring merchandise. There was a large number of small orders which indicates the limited stock carried at present by the retail trade. All in all the market took on a stronger tone from the manufacturers standpoint during this period of the month although buyers were slow to respond. The demand for balbriggans increased materially and the majority of manufacturers were accepting orders only on an advance in price. This advance averaged from five cents to ten cents. The orders on hosiery still indicated that buyers were looking for better grades of material than last season and thus the very sheer silk to retail at low prices were not receiving the call they previously had.

The latter part of the month found the hosiery market quieter, but manufacturers in a much more favorable position. There seems to be considerably more interest in white hosiery than for sometime past and there are rumors that this season gives promise for a larger demand in white hose and half hose for summer wear than for many seasons past. Advances in both hosiery and underwear were held up to and it seems probable that these prices will stick, although the amount of business transacted remains comparatively small. There was a general advance on mens ribbed underwear for fall wear, amounting to about 25 cents a dozen from the lowest level of the season and about half that above the opening prices. One manufacturer of balbriggans has increased his price on four and a half pound goods to $1.85 and in some instances, underwear manufacturers made advances because they were well sold up and they could not take care of any more immediate business. The raw material market however, is largely responsible for the general advance. As the month closes there is a better inquiry for fall underwear and the hosiery market is still reported to be firm, but no general advance has been made. The spring duplicate trade has broken out in spots. but is not expected to assume its normal plane until April. The improbability of any action being taken during the present session of Congress on Schedule I is being somewhat reflected by the general optimism of the textile market.

A subsidizing of Chile's merchant marine is under discussion with the prospect that something may be done during the present session of Congress. A recent Government report gives the number of vessels flying the Chilean flag as 161 on January 1, 1911, with a total tonnage of 96,453 tons. There was a net gain of 1,324 tons during the year, but since the first of January, two steamers have been wrecked, reducing the tonnage by 3,394 tons. There are but two steamers and one sailing vessel of more than 2,000 tons in the service at present. Of the 147 captains of the three grades holding license only 42 are of Chilean birth.

The scheme proposes an annual subsidy of $241,247 United States gold, the rate ranging from $7.66 per ton per year for the fastest steamers to about 22 cents per ton for the poorer sailing vessels. Chilean merchant vessels seldom leave the waters of the west coast of South America, save a few sailing vessels that go to the west coast of the United States for lumber.

THE YARN MARKET.

The yarn market for March showed, if anything, increasing firmness in yarn prices. The amount of business transacted was smaller in comparison than is usually the case, but this was owing largely to the firmly held prices of the spinners. The buyers declining to purchase only when forced to do so. While the close of February showed few purchases and those mostly for spot delivery, it was a sellers market and seemed likely to continue so, until prices reached a level satisfactory to the manufacturers. The business done was chiefly for weavers, although knit goods manufacturers operated conservatively. At the beginning of the month spinners were still confident that prices would advance and some instructed dealers to hold consigned stock for a half cent increase. This optimism was regarded as justified in view of the existing conditions, although there were many varying opinions regarding future business. The advances at this period of the month was confined largely to Southern skeins and warps, both single and ply for weaving yarns. On knitting yarns there was not so much change noticed. Fine yarns, grew in strength, largely because of the difficulty in securing long staple cotton of sufficient quality to suit manufacturers and in some cases orders were declined because of the scarcity of the proper grade of cotton.

While the middle of the month showed a decided falling off in the amount of yarns changing hands, it had no visible effect on prices. There was still a fair demand for spot delivery in weaving yarns, but the call was not so general as was the case earlier in the month. Buyers were slow to purchase and were holding back owing to the prices spinners demanded. Finished goods were slowly advancing, but it was stated that these advances were a long way short of covering the stiff advances which had been named on yarns. Spinners however, were firm in their price ideas and evidently intended to secure a reasonable margin of profit on yarns sold. Knitters were making more inquiries during this period and seemed to be anxious to secure supplies of spot or nearby yarns. It is generally believed that few knitters covered when prices were on very much lower levels and must therefore come into the market for supplies before very long if they expect to turn out orders which they have been booking during the past few weeks. The best demand at this period of the month was from wire and webbing people and from the continuing need of the lace curtain manufacturers. The market for laces during the past few months has been improving strongly and this result is felt by manufacturers of yarns and thread for this class of material. Dress fabric manufacturers were also offering a moderate field for consumption.

The closing section of the month was characterized by practically the same feeling that had been noticeable in the earlier weeks, namely, a tendency to quietness because of the high prices so stiffly maintained by the spinners. Business came forward in fits and starts, but principally for spot or nearby delivery. Other buyers did not seem to be interested in yarns at any price. Weavers are taking yarns with which to meet their most pressing needs and in a few instances are covering through into the summer months. Conservative manufacturers, however, as a rule, are not looking forward to any lower prices for cotton and in fact are inclined to believe that July will see a considerable increase in the price of the raw staple in the grades desired. Some indicated their belief that all manufacturers in need of cotton yarns would do well to cover their future requirements on the earliest possible date. Trade has not manifested any great demand for yarns beyond June, but indications point to a continued steady market with a probable increase in the amount of business transacted a little later in the season.

Following are the New York quotations for the end of the month:

SOUTHERN SINGLE SKEINS.

4s to 8s	16½@17	20s	19½@--
10s to 12s	17 @17½	24s	20 @--
14s	18 @--	26s	20 @--
18s	18½@--	30s	23 @23½
20s	19 @19½	40s	28 @30

SOUTHERN TWO-PLY SKEINS.

4s to 8s	17 @17½	36s	29 @30
10s to 12s	18 @18½	40s	30 @31
14s	19 @--	50s	38 @--
16s	19 @--	60s	44 @46
20s	21 @--	3-ply 8s upholstery	17½@--
24s	22 @22½	4-ply 8s upholstery	17½@--
26s	22 @22½		
30s	23½@24		

SOUTHERN SINGLE CHAIN WARPS.

10s to 12s	18 @18½	24s	21 @--
14s	18½@19	26s	21½@--
16s	19 @--	30s	23½@24
20s	19½@20	40s	31 @--
22s	20 @--		

SOUTHERN TWO-PLY CHAIN WARPS.

8s to 10s	17 @18	26s	22½@--
12s to 14s	19 @19½	30s	24½@25
16s	19½@20½	40s	31 @31½
20s	20½@21	50s	38 @39

SOUTHERN PEELER FRAME CONES.

8s	17½@--	18s	19 @--
10s	17¾@--	20s	19½@--
11s	17¾@--	22s	20 @--
12s	18 @--	24s	20½@20¾
14s	18½@--	26s	21¼@--
16s	18¾@--	30s	22 @22½

TEXTILE MILL BUILDING ACTIVITY.

At Accrington, where no new mills have been built for six years, Messrs. Highams, (Ltd.) have decided to build a cotton shed, to be known as Woodnook mill, for which plans have been prepared by Henry Moss. Another new weaving shed, for 1,000 looms, with the usual preparatory machinery, is to be erected on a site off Whalley Road, Accrington. A new mill is to be erected at Rishton for the Albert Mill Co., of Accrington. Ashton, Frost & Co. are the contractors for the shed, which is to contain 650 looms.

Contracts have been signed for two new weaving sheds to be erected at Darwen, one at Moss Bridge, to contain about 900 looms, and the other at Highfield, with 650 looms. Both will be built by the Darwen Mill Building Co., which erected the Cobden and Peel Mills.

The Crane Manufacturing Co., Haslingden, has decided to erect a new weaving shed adjoining its present factory, Longshoot mill, to hold about 400 additional looms.

It is announced that a large new weaving shed is to be put up at Padiham, on vacant land opposite Wytham Street and close to Green Brook. The shed will contain 2,000 looms, with the usual preparation machinery.

The erection of these mills will give an additional capacity of about 6,000 looms to Lancashire industry. A new mill for the manufacture of quilting material in connection with slipper making and other trades is to be erected at Waterfoot and installed with the latest type of machinery.

COTTON MANUFACTURING.

DESIGNING AND WEAVING TAPESTRY FABRICS.

(Contributed Exclusively to Cotton.)

BY MILES R. WHITHAM.

One of the most interesting studies in connection with fabric structure is that of tapestry fabrics, of which there are a large number of types made from cotton yarns. These fabrics may, however, be classified under certain headings, such as one warp two wefts, two warps one weft, two warps two wefts, and so on in order that their construction may be readily indicated and their principle of structure determined. The simplest types are of course, those in which there are the least systems of warp and filling since any increase in the number of systems of warp and filling tend of necessity to increase the complexity of the structure.

From one point of view the building up of a tapestry fabric is a simple matter, but to determine the structure of any fabric that may be placed for quotation is quite different. The method of manufacture adopted, the system

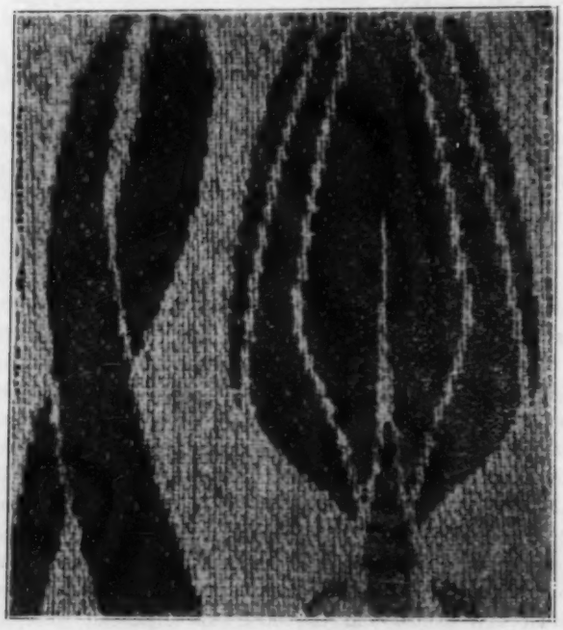


Fig. 1. An Example of Tapestry Fabric.

of tie up used, the card-cutting instructions required, etc., need no small amount of skill to decide and their determination from a sample of woven fabric is a problem worthy of attention from any student of fabric structure or practical mill man. Unlike most simple fabrics this class of structure cannot be effectively analyzed by means of the counting glass in the usual manner and then the weave placed on design paper. The most efficient, simple and practical method to analyze a tapestry fabric is by making a section of the cloth, that is by tracing the course of the warp threads or the filling threads with respect to their intersections when certain effects are being produced. By this means the position of the warp thread and filling threads may be determined for each respective effect in the cloth and from this section the working of each thread on design paper may be obtained if required, or a design may be painted up and the cardcutting instructions, which can be readily ascertained from the section written out.

In the simpler types of tapestry fabrics involving the use of only one warp and two fillings the benefit of this method of procedure is not so apparent but when treating with fabrics having two or more systems of warp and two or more systems of filling, its advantages, once the process is thoroughly understood, are self-evident. A tapestry having one system of warp threads and three systems of filling threads is shown at Fig. 1, in which it will be seen that there are three effects, two being obtained by floating filling and the other by combining the warp with the third filling. In some cases this class of tapestry has only two systems of filling, the face and back of the cloth being entirely of floating filling, while occasionally the warp is utilized to form a third effect. When only two systems of filling are used the cloth is reversible the system of construction being such that when one system of filling is on the face the other system of filling must be figuring at the back of the cloth in order to make a perfect structure. By this means the warp is practically hidden since the binding points are hidden by the filling floats, the yarn used being

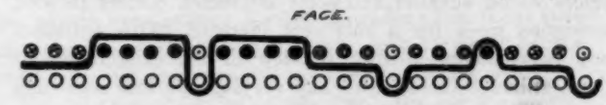


Fig. 2.

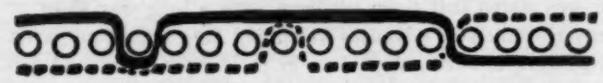
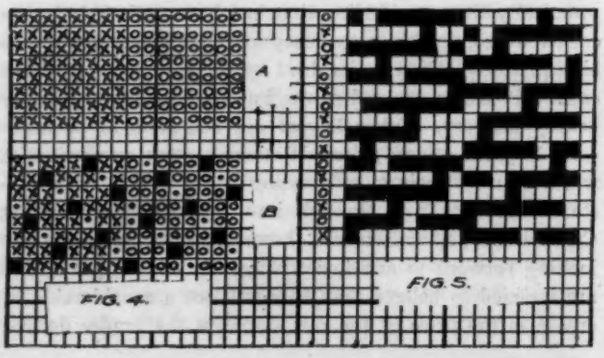


Fig. 3.

coarse and so an apparently entire filling surface is the result. In other cases, as in the illustration Fig. 1, the warp yarn is utilized for figuring purposes and an additional color effect is obtained. In making sections from these fabrics the one showing the relative positions of the warp, Fig. 2, is generally of most value for the warp is really the only factor under control, therefore, the warp threads practically determine the position of the filling threads. In cases, however, it is useful to have a section showing the position of the filling threads as shown at Fig. 3.

A small block design is given in Fig. 4A, whilst Fig. 5 shows the working of the separate ends and filling in detail for such a block effect. The designs for these cloths are painted up on design paper, solid in two colors, but the



binding points are inserted in two other distinct colors as indicated at Fig. 4B. Assuming that the colors are red and blue for the filling, (indicated by X's and O's in Fig. 4A), and those for binding are black and yellow, (indicated by solid squares and dots in Fig. 4B), the instructions for the card cutter would be as follows:

Red filling, cut blue (O's) and black (solid); miss yellow (dots).

Blue filling, cut red (X's and black (solid); miss yellow (dots).

Yellow (dots) marks are always missed so that a warp thread remains down at those parts to bind, on both pieces, filling at the back; black (solids) marks always cut so that a warp thread remains up for those places on both filling picks to bind filling on the face. In the section given at Fig. 2, it will be noticed that the cross sections of the filling threads are marked to conform with the marks used in designing, thus indicating how the various effects are obtained. For instance the black solid marks underneath the floating face warp thread, indicate that to obtain a warp float, black marks are necessary on the design. A dot inside the cross section indicates that the warp thread is left down on both colors of filling to bind at the back.

Each horizontal row in Fig. 4B is read twice by the card cutter, once for the red filling and once for the blue filling as shown at Fig. 5. An ordinary type of jacquard harness is required for this class of cloth, and if good results are required as to the delineation of the design a pick and pick loom is essential.

COTTON MILL MACHINERY CALCULATIONS.

(Contributed Exclusively to COTTON.)

BY B. M. PARKER.

PART XIV.

The winding of the roving on the bobbin is accomplished by the excess speed of the bobbin which is gotten from the bottom cone by means of the compound. The speed of the bottom cone is regulated by the position of the cone belt, which is automatically changed by the tension gearing at the end of each layer wound. Consider the bobbin to be 1 inch in diameter when empty and 4 inches when full, then the bobbin will increase in uniform amounts from 1 inch to 4 inches, a total increase in diameter of 3 inches which, supposing the cones to be 30 inches long, is an increase in diameter of 1/10 inch for every inch of belt traverse, or ½ inch increase for a belt traverse of 5 inches or 1/6 the total length of the cones.

The above, although true, is misleading, as the statement is often made, based on the above facts, that the speed of the bottom cone and hence of the bobbins decreases in regular amounts for each layer wound from start to finish of a set. It is true that the increase in bobbin diameter is in regular amounts for each layer wound, or each movement of the cone belt but the proportional increase in bobbin diameter is not regular, being larger at the beginning than at the end of a set; hence, the variation in speed of bottom cone and bobbin is not regular, but decreases as the bobbin builds by a lesser amount for each layer wound. This will be seen when we consider that, at the start of a set, we are winding the roving on a bobbin that is only 1 inch in diameter, while, at the end of a set the diameter of the bobbin is 4 inches hence, the relative increase in bobbin diameter, by the addition of one layer of roving, must be greater when the bobbin is small than when it is large.

When the bobbin has become 2 inches in diameter, it has wound on a thickness of roving of 1 inch, which is one-third the total increase in the bobbin diameter, so the belt must have traveled one-third the length of the cones. Now the bobbin, at this point, is one-half its full diameter so its excess speed and also the speed of the bottom cone must have decreased by one-half, as it now takes only one-half the number of revolutions of the bobbin to wind on the delivery of the front roll. The diameter of the bottom cone at this point will be the same as that of the top cone.

The following facts are true and demonstratable:

First, straight faced cones will not give the proper results when applied to fly frames.

Second, the speed of the bottom cone and bobbin does not decrease in regular amounts for every layer wound on the bobbin, but must decrease in inverse ratio to the proportional increase of bobbin diameter.

Third, at all opposite points of a correct pair of cones the sum of the top and bottom cone diameters will be equal, the cones will give a variable decrease in the speed of the bobbin, this decrease being larger at the start of a set than at the end and the outline of the cones will be concave and convex curves, equal diameter coming at one-third the length of the cones, measured from the large end of the top cone. The top cone is concave and the bottom cone convex, the greatest curve in their outlines coming at the large end of the top and the small end of the bottom cone.

As the total speed of the bobbin is governed by the delivery of the front roll, the size of the bobbin and the speed of the spindle, the required speeds of bobbin and bottom cone can be figured and the correct diameter deteereters determined at any point in the build of a bobbin.

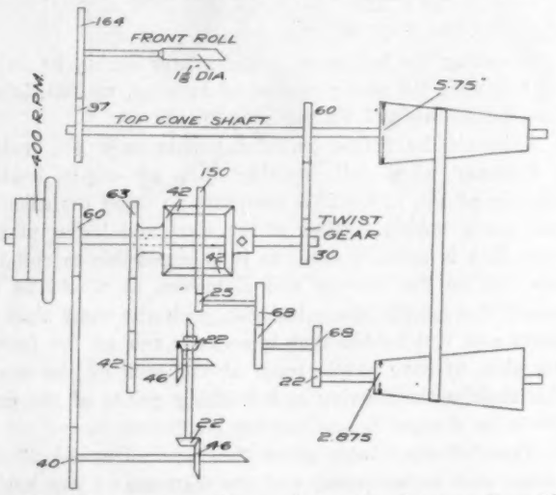


FIG. 38. SPINDLE AND BOBBIN GEARING. LOWELL 7 BY 3½ INCH FLY FRAME.

Fig. 38 is a diagram of the spindle and bobbin gearing of a fine fly frame built by the Lowell Machine Shop. This frame is 5¼ inches space and 7 inches traverse and builds a bobbin 7 by 3½ inches, the diameter of the empty bobbin being 1⅜ inches. Main shaft speed at 400 R. P. M. and using a 30 tooth twist gear, gives a top cone speed of 200 R. P. M. The front roll speed is:

$$\frac{400 \times 30 \times 97}{60 \times 164} = 118.29 \text{ R. P. M.}$$

The front roll is 1⅛ inches in diameter and will deliver 418.04 inches of roving per minute. The speed is:

$$\frac{400 \times 60 \times 46}{40 \times 22} = 1254.54 \text{ R. P. M.}$$

As we start with an empty bobbin diameter of 1 inch, it will wind on 3.1416 inches of roving for every revolution that it makes, hence, the speed of the empty bobbin to wind on the delivery of the front roll is as follows: $418.08 \div 3.1416 = 133.065$ R. P. M.

This allows for no increase in bobbin speed to provide for the proper tension on the roving and should be increased about 1.67 per cent, which gives 135.27 R. P. M. of bobbin to wind on the delivery of the front roll. This is the excess speed of the bobbin and must be added to the speed of the spindle to give the total speed of the bobbin, as follows: $1254.54 + 135.27 = 1389.81$ R. P. M. of bobbin.

Take this figured speed of the bobbin as a starting point, the following figures will give the speed of the sleeve gear:

$$\frac{1389.81 \times 22 \times 42}{46 \times 63} = 443.12 \text{ R. P. M.}$$

The speed of the sun-wheel equals one-half the difference between the speeds of the main shaft and sleeve gear, so:

$$\frac{(443.12 - 400)}{2} = 21.56 \text{ R. P. M. of sun-wheel.}$$

The speed of the bottom cone at the start is found from the sleeve gear speed, as follows:

$$\frac{21.56 \times 150 \times 68}{25 \times 22} = 399.8 \text{ R. P. M. or}$$

practically 400 R. P. M.

By taking the bobbin at any diameter during its build and following the above method of figuring, we can determine the bobbin and bottom cone speeds.

Although the frame builds a bobbin only 3½ inches in diameter when full, starting with an empty bobbin diameter of 1⅜ inches it is necessary to make the calculations for a bobbin smaller at the start and larger at the finish than is actually used, as it is impossible to run the cone belt on the extreme end diameters, as would be required if we made the calculation with the same sizes to empty and full bobbin that is actually run on the frame, and also, to have ample room at the ends of the cones. This enables the starting and finishing points of the cone belt to be changed to suit varying conditions.

The following table gives the required speed of the bobbin and bottom cone, and the diameter of the bobbin at the start of a set and after each belt movement of 5 inches.

Speed of bottom cone	Speed of Bobbin	Diam. of Bobbin
Start 400	1389.81	1 inch
1st point 266.66	1344.77	1½ inches
2nd point 200	1322.14	2 inches
3rd point 160	1308.68	2½ inches
4th point 133.33	1299.56	3 inches
5th point 114.33	1293.22	3½ inches
6th point 100	1288.34	4 inches

These figures were obtained from calculations based on the actual delivery of the front roll, spindle speed, and the diameter of the bobbin, allowing for tension during the winding of the roving. This last is a variable quantity and there are other factors to be taken into consideration, still the above speeds are accurate enough for all practical purposes and are very close to those that would be found, under the same conditions, in the running of the frame.

If we now figure a pair of cones, based on the speeds in the above table, we will get the results shown in Fig. 39.

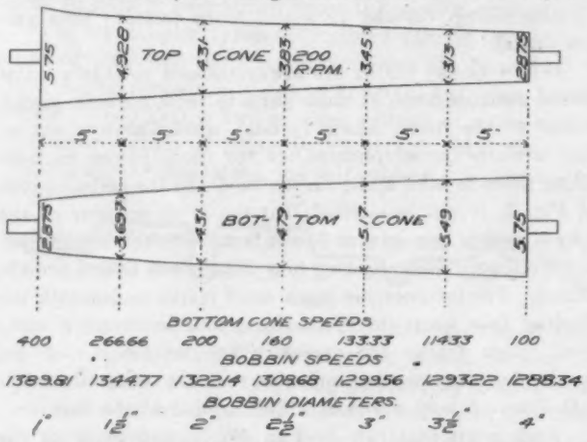


FIG. 39. A PAIR OF CONES FIGURED ON THE BASIS OF THE TABLE OF SPEEDS GIVEN.

This shows a pair of cones, with the cone diameters, bottom cone and bobbin speeds for every belt movement of 5 inches.

The speed of the bottom varies in inverse ratio to the proportional increase in bobbin diameter, then the following rule for figuring bottom cone speed is correct:

The speed of the bottom cone at start × dia. of empty bobbin ÷ the diameter of the bobbin at any point = the speed of the bottom cone at that point.

From this we find that the bottom cone at the first point, or at the end of a traverse of 5 inches, will have a speed of 266.66 R. P. M. as follows:

$$\frac{400 \times 1}{1.5} = 266.66$$

The same method of calculation was used to get the bottom cone speeds at the remaining points and in every case it will be noted that these speeds will coincide with those shown in the table.

With the speeds of bottom and top cones known, the diameters of the two cones were found by the following rule: *Sum of cone diameters × bottom cone speed at any point ÷ sum of cone speeds at that point = the top cone diameter.* Also the sum of the cone diameters — top cone diameter = the bottom cone diameter.

Then taking the figures for the first point, the sum of the cone diameters being 8.625, we will get the following as the cone diameters at this point:

$$\frac{8.625 \times 266.66}{200 + 266.66} = 4.928$$

$$8.625 - 4.928 = 3.697$$

Then the top cone diameter will be 4.928 inches and the bottom cone diameter will be 3.697 inches. The diameter of the two cones at the other points were figured by the same method.

It will be noticed that at the second point, or when the belt has moved 10 inches or ⅓ of the length of the cones;

the bobbin has increased 1 inch in diameter or ⅓ its total increase and is ½ its full diameter; the speed of the bottom cone is ½ its speed at the start; and the diameters of the two cones are equal. This fact proves that straight faced cones cannot be used as their equal diameters come at the middle of the cones. It will be also noticed that the diminution in the speed of the bobbin is greatest during the first movement of the belt, this decrease growing smaller as the end of the set is reached by a varying amount. This is the actual conditions, for the proportional increase in bobbin diameter is greatest at the start of a set, when the bobbin is small, although the actual increase in bobbin diameter is practically the same for each layer wound.

It will be noticed that the results obtained from this pair of developed cones are similar to those as figured from the front roll delivery, hence the cone outlines must be correct. For comparison select the figures for the second point and start with the main shaft speed and figure the total speed of the bobbin and compare with the required speed as given in the table or with the speed as shown in Fig. 39. The speed of sun-wheel is

$$\frac{400 \times 30 \times 4.31 \times 22 \times 68 \times 25}{60 \times 4.31 \times 68 \times 150 \times 68} = 10.78 \text{ R. P. M.}$$

The speed of the sleeve gear is $400 + (2 \times 10.78) = 421.56$ R. P. M. Then the speed of the bobbin is obtained as follows:

$$\frac{421.56 \times 63 \times 46}{42 \times 22} = 1322.16 \text{ R. P. M.}$$

This speed is practically the same as obtained by our former figures and using the above method and figuring the bobbin speed at any point will give results that will be practically the same as those found before. This shows that the cone diameter given in Fig. 39 must be correct and their method of development meets the requirements in the case.

(To be continued.)

A METHOD OF PRODUCING NEW STYLES FOR COTTON CLOTHS.

(Contributed Exclusively to COTTON.)

BY J. W. KIRKWARD.

It is intended in this article to show the method of making new designs for stripes and figured goods as easy as possible, so that whatever idea may occur to the designer, manager or manufacturer, this may be drawn out carefully on an ordinary piece of paper, and with practice may be conveyed to the design paper and thence to the cloth for any desired pattern. By using a fine rule the width of stripes may be measured and worked out to the number of threads desired. The ground work may be done in the same way.

Take for example Fig. 1. On measuring this we find that the pattern repeats on about half an inch warp and weft way. We will assume that the cloth required has 64 threads per inch in the reeds, and 64 picks of filling per inch, thus Fig. 1 will require 32 threads and 32 picks of filling to make a repeat. We further notice that a warp figure is intended ,and the ground work may be plain or twill, in this case we will make it plain ground.

On further examination we find that every 16 threads of figure turn in the opposite direction, and that in each of the 16 threads there are four distinct floats of warp, which will float over four picks of filling each, thus making half the figure on 16 threads and 16 picks. When the first half of the figure has been woven the second half begins on the next pick of filling. All details must be considered to have a correct design from the figure given. Fig. 2 shows the

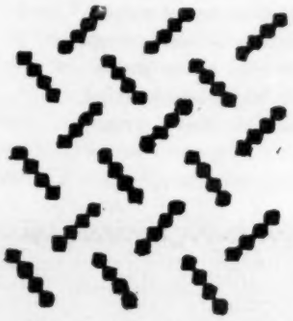


FIG. 1. THE ROUGH DESIGN.

design on paper for Fig. 1 the ground work being dotted to show the effect more distinctly. The drafting of the harness and the dobby is also given.

Fig. 3 is a design for a fancy shirting or blouse cloth and is intended to be woven in a cloth with say 80 threads

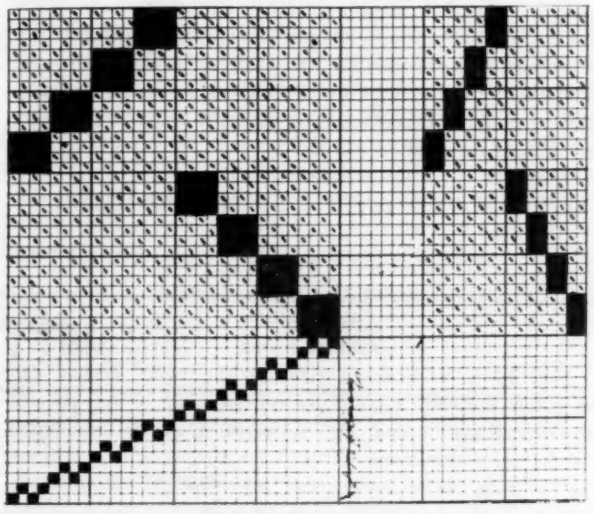


FIG. 2. THE COMPLETE DESIGN, WITH HARNESS DRAFT AND DOBBY WEAVE.

per inch and an equal number number of picks for filling. On the measuring pattern we will find it repeats on about three-fourths of an inch; thus 60 threads will be required for the full stripe. In one-sixteenth of an inch we shall require 5 threads, thus the heavy stripe will require about 16 threads allowing a little for shrinkage during weaving. The fine stripe will require two threads

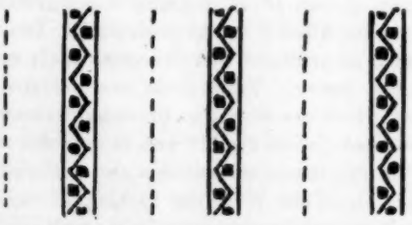


FIG. 3. ANOTHER ROUGH DESIGN.

only, thus, 42 threads will be required for the ground which must be equally divided, allowing for shrinkage, say 44 threads for the ground, the full warping pattern would be as follows:

22 threads white ground.
2 threads blue fine stripe.
22 threads white ground.
2 threads blue heavy stripe.
2 threads white heavy stripe.
8 threads blue heavy stripe.
2 threads white heavy stripe.
2 threads blue heavy stripe.

62 threads per pattern.

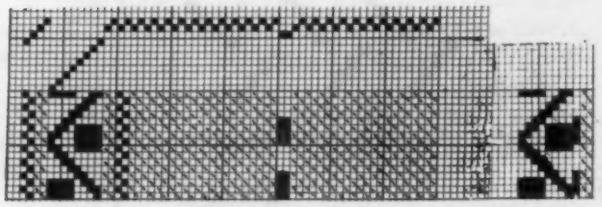


Fig. 4. The Complete Design for Fig. 3.

Fig. 4 gives the design on paper for Fig. 3. The white threads are shown in dots and the colored stripes in full squares. The full design, drafting and dobby weave are given. By this method simple or elaborate designs can be carried out successfully and those proficient in the method can readily draw out a new design on an ordinary piece of paper and retouch it, or improve on it as designed, and imitate the same in cloth.

DETAILS OF A FINE SPINNING MULE.

(*Contributed Exclusively to* Cotton.)

BY WM. SCOTT TAGGART, M. I. MECH. E.

FOURTH PAPER.

Fig. 13 is a detached view of the twist motion and the roller delivery motion as represented in the general drawings Figs. 11 and 12. A worm A on the rim shaft

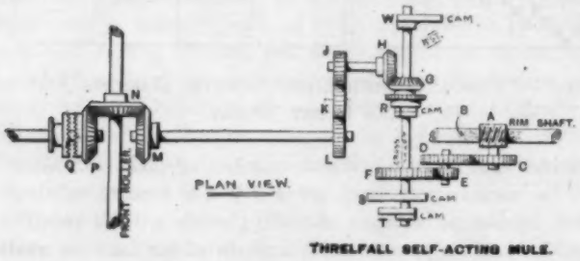


Fig. 13. Twist Motion. Plan View.

drives a worm wheel B; on the shaft B is the change twist wheel C gearing into D. E. forming a compound carrier with D drives the wheel F on the cross shaft. The whole of this gearing is so arranged that this cross shaft makes one revolution per draw. Three cams are mounted on the shaft, all of which are shown in previous drawings. Cam T is indicated at "b" in Fig. 11 and is used for the twist. Cam S is the setting-on cam and this also is shown in position in Fig. 11. Cam W is the backing-off cam and its relative position and function can be seen also in Fig. 12.

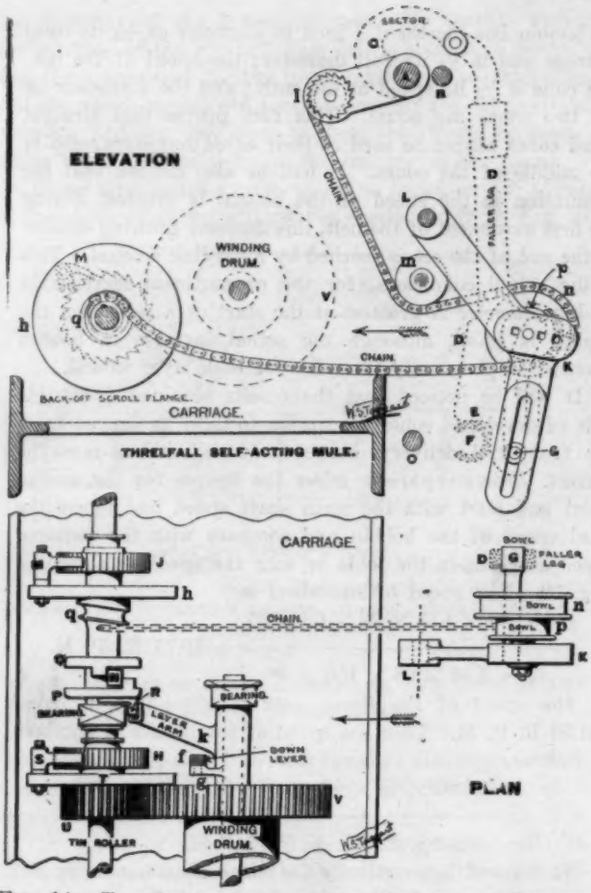


Fig. 14. The Backing-off Chain Tightening Motion.

The cross or twist shaft is utilized to transmit motion to the rollers during the run in of the carriage. The catch box Q is open so the rollers are disconnected from their main drive, to relieve the tension on the yarn as the carriage comes up, the rollers are revolved to a slight extent, the amount being one requiring careful adjustment, especially for very fine twist counts. At R is provided a ratchet wheel with a clip and pawl so that R can only be driven in one direction. On the boss of R are placed two cams that can be adjusted relative to each other and the greatest part of the surface of each being circular.

The pawl when resting on the circular part is kept out of contact with the ratchet teeth, but on the cam part coming round the pawl falls into the teeth and turns the ratchet wheel for whatever portion of a revolution the two cams have been set to give. This motion is transferred through

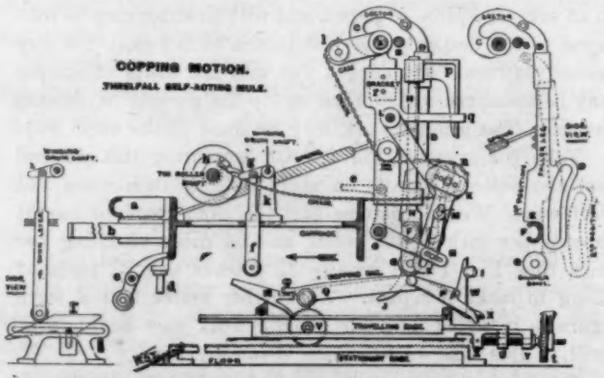


Fig. 15. Details of the Winding Drum.

G. H. J. L. M. to N on the front roller. If necessary the two cams can be moved so that they present a continuous circular path for the pawl finger and in such a case no roller delivery will be given.

The backing-off chain tightening motion associated with the Trelfall mule is illustrated in Fig. 14. If this drawing

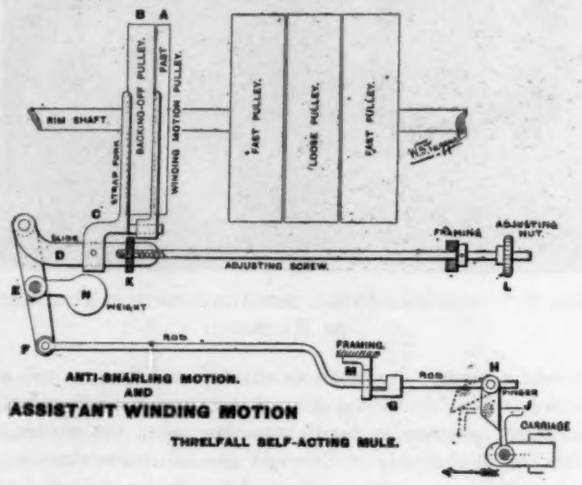


Fig. 16. The Assistant Winding Motion.

is studied along with Fig. 15 it will be almost self-explanatory. The reversal of the tin roller during backing-off pulls down the arm "l" and raises the section C and the faller leg. The slack chain that results through the arm "l" not requiring to be pulled down so low after each draw, is wound on a snail "q" and this snail gradually picks up the chain through an incline operating on a lever and ratchet wheel. This is shown clearly in both Figs. 14 and 15, whilst Fig. 15 gives the detail in a separate sketch.

The short shaper, which is a special feature of all fine spinning mules, is shown in skeleton in Fig. 15 as well as its connection to the faller shaft. The long rack is a fixture whilst the short rack and shaper are carried by square. It will thus be seen that as the carriage makes its inward run, the shaper will be moved in the opposite direction and so pass under the bowl G on the slide which carries the faller leg. When the stretch is altered, all that is required is to alter the wheel V to the new conditions. One important feature of all the mechanism of a fine spinning mule is adjustment and another feature is locking or safety arrangements. A careful examination of illustrations already given will show how care has been bestowed on the prevention of any mechanism coming into operation before it is required and the necessity of one action being complete before another commences.

The assistant winding motion is shown in Fig. 16. That position only of the head stock is drawn which is necessary for our purpose. The general position can be seen in previous drawings. In this motion the backing-off belt is utilized. The belt is always running, so by the side of the backing-off pulley is placed a narrow pulley of the same diameters which is keyed to the rim shaft. This can be seen clearly on reference to Fig. 2. The belt is provided with a strap fork and this fork is coupled by a lever centered at E to a rod having a tumbler H at one end. The rod is further provided with a stop G pressing against a bracket M. As the carriage is completing its inward run a projection J comes against H and in passing lifts H and its rod so that the stop G is raised and a slot in the bracket M permits it to pass through under the influence of the weight N. The strap fork C moves from the backing-off pulley to the winding pulley and so the rim shaft will be driven and consequently the spindles. The amount of belt that comes on the winding pulley is regulated by the rod and stops that can be carefully adjusted by the spinner through the handle nut L.

KNITTING

THE KNITTED FABRIC.

(*Contributed Exclusively to* Cotton.)

BY WILLIAM DAVIS, M. A.

When the plain stitch is being formed the yarn is subjected to considerable strain as the sinkers fall on to the yarn it is straightened out temporarily and remains in this stretched condition until the row of loops has been completed in the knocking-over process. As soon as this takes place the yarn springs back to the natural position of the curved loop. This explains, to some extent, the contraction of fabric just after it leaves the needle, the yarn recovers from its stretched position and in so doing causes the fabric to contract in width. A similar contraction takes place in the direction of the length when the fabric is removed from the frame or even as soon as it reaches the winding up roller. For the fabric to be properly drawn clear of the needles it must be subjected to a certain vertical strain, which strain being removed, contraction takes place longitudinally.

A cloth in which the correct size of yarn has been used to suit the frame readily recovers its natural position after stretching, but if the thread be too fine in diameter for the machine gauge, it will not have the same elasticity. It will yield readily to lateral or longitudinal strain and will not readily recover its form after the strain has been removed. Figure C shows a photo-micrograph of a "lean" knit fabric where the loops are decidedly elongated and Fig. D shows the same fabric drawn out in the direction of the width.

A plain knit yields more readily in the width than the length, a fact readily explained when we consider that the single thread is formed into loops in a horizontal direction and it is in that direction that the greatest effect is obtained when the fabric is elongated, the stitches per inch will be greater in the width than length and when the loops are stretched in the width, the number of loops per inch in the length will be considerably greater than in the width.

These are two results which naturally follow when the yarn diameter is not suited for the frame. Even with a suitable yarn, however, the form of the loop may be regulated by lengthening or shortening the fall of the sinker so that for the same gauge we may have the work slack or tight at will. There is always a length of fall for any particular yarn in any gauge which will give a fabric with a symmetrical loop. If the sinker drop is too short, "dumpy"

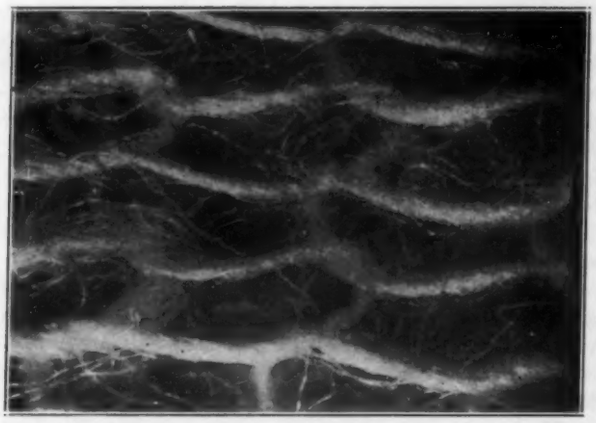


Fig. C. A "Lean" Knit Fabric Showing Elongated Loops.

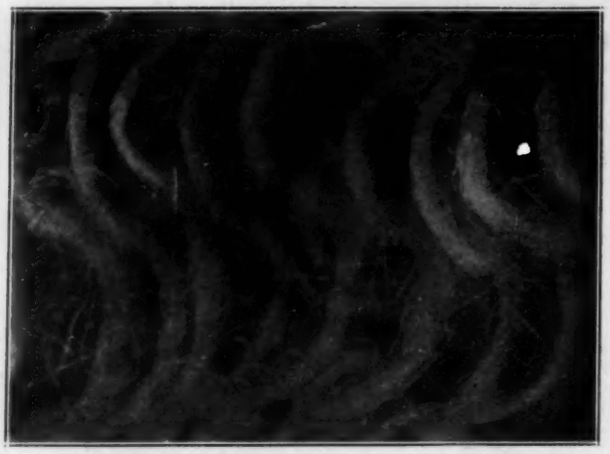


Fig. D. The Same Fabric Stretched in the Direction of Width.

loops will result in that the work will be too full and tight. These matters are of great importance with regard to the weight and finish of the goods. The length of the various parts of garments is generally taken in number of courses, so that if the length of loop or course be not accurately determined, the measurements will not come according to calculation.

Professor Willkomn states that for general work the fall of the sinkers should be equal to a needle division. That is for a fabric with 12 needles per inch, the fall should be 1/12 inch deep. In this way will be obtained an approximately symmetrical loop, but this does not agree with present day practice. The general run of fabrics for underwear show more courses per inch (in the length than in the width, this is done to obtain a thick set fabric and the increase in courses per inch in the length is greater in a coarse than in a fine fabric. Thus in the statement for knitters in the south of Scotland they are expected to put in 12 courses per inch for a 12 gauge fabric which has only $12 \times 2 \div 3 = 8$ needles per inch.

IMPERFECT LOOP FORMATION.

From what has been said regarding the build of spring needle rotary frames, it will be readily understood that the knit goods manufacturer has to do with very delicate mechanism adjusted, as seen from the tables, to the thousandth part of an inch. A very slight deviation from the standard causes serious imperfections in loop formation. The needles must be all the same thickness, as also must be the sinkers. Should a coarser needle be substituted, a difference will at once be noticed in the fabric at that point. This frequently occurs in practice in needle breakage when the workman runs out of a supply of the right size of needle, sometimes substitutes any, coarser or finer, which he happens to have in hand. A good frameworker should keep a strict lookout on the condition of his needles and an experienced hand can at once tell whether a needle is higher or lower than its neighbors by running his forefinger across the row. His practiced eye can also tell whether the needles are at equal distances apart and with the hand pliars he can soon rectify deficiencies.

The same procedure must be followed with regard to the sinkers, when they become worn, new ones should be inserted. Illustration E shows clearly the nature of defect in loop formation which results when these conditions are not complied with. In the center can be noticed a row of loops considerably wider than those around, an imperfection which results when a needle is not in its true position but has been moved a little to the right or left. Should the sinker nose be getting worn a similar defect is likely to result. The irregularity is all the more noticeable because to supply thread for the row of large loops material is taken from those adjoining so that we have a slack and a tight row side by side.

These occur in strongly marked lines all down the cloth and seriously reduce its value in the market. Similar lines

Fig. E. Defect in Loop Formation Caused by Worn Sinkers or Bent Needles.

Fig. F. Long and Short Loops Produced on a Worn Machine.

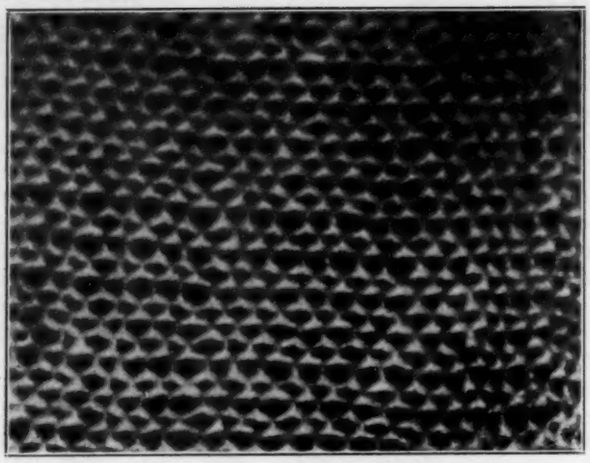


Fig. G. The Combined Effect of the Defects in E and F in One Price of Fabric.

may be formed in a horizontal direction when the succeeding courses are not treated exactly alike in the course formation. The sinkers receive their motion from the slur-cock which traverses the frame alternately from right to left and from left to right. The slur may be worn so that the sinkers produce shorter sinker loops in one course than in the other. A defect which occurs in alternate rows. An illustration of this is shown in Fig. F, in the center of which can be noticed a horizontal row of loops much larger than the rows on either side.

Fig. G is a photo-micrograph of a fabric less highly magnified where the two kinds of imperfections just described are combined. In the direcion of the length can be seen needle and sinker lines with their large rows of loops whilst horizontally at intervals can be noticed rows of loops larger than their neighbors.

THE PREPARATION OF YARNS FOR KNITTING.

(*Contributed Exclusively to* Cotton.)

BY H. K.

The preparation of yarn for knitting machines is of considerable importance. In the first place yarns for knitting should be even, elastic and soft twisted; should be free from specks and impurities of all sorts; should contain but few knots and these should be made as small as possible with short ends. A knot of any size is liable to make a hole in the fabric and a large knot is sure to do so and the same is true of slubs or bunches in the yarn.

The winding of yarns is what we will now consider in this work of preparing yarn for knitting. The larger mills usually make their own knitting yarns while the smaller mills may buy their yarns from outside sources. In either case they have the same problem of winding to cope with. The yarn may arrive at the winding room in the form of cops, bobbins, skeins or cones. There are two distinct types of winding machines, each of which has its own special advantages, these are cone winders and bobbin winders. Let us consider bobbin winding first. The bobbins generally are about 17 inches high and 6 inches in diametetr at the base. The bobbin for about half-way up is cone shaped and when reaching a diameter of 1½ inches continues that diameter for the remainder of the bobbin. There are several different makes of winding machines of this type in use, but they are practically the same with the exception of the driving of the spindles.

The cone part of the bobbin is covered by a course twilled fabric, the purpose of this being to provide some clinging surface for the yarn to build up on. From the size

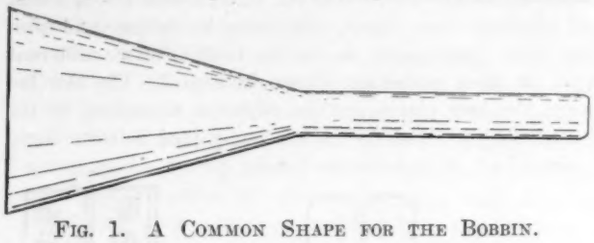


Fig. 1. A Common Shape for the Bobbin.

of the bobbin it can readily be seen that it will hold a large quantity of yarn and this in itself is an important factor. The winding must be done with as even a tension on the yarn as possible. Supposing the spindle carrying the bobbin revolves at a constant speed, what is the result. When winding on the smaller diameter of the bobbin, it winds on say 6 inches of yarn per revolution of spindle while at the base it will wind 24 inches of yarn per revolution. The tension in this case will be less at the top of the bobbin than at the base because of the greater strain put on the yarn while being wound on so fast. To overcome this, various tension devices are used, which can be regulated so that the yarn will wind with as equable a tension as possible throughout the length of the bobbin. We have already stated that knitting yarns require to be elastic and with the application of much of this tension on the yarn in winding, it destroys more or less of this elasticity in the yarn, according to the method by which the tension is applied.

The building of the yarn on the bobbin is done in what is known as the filling wind. This wind is obtained by the action of a heart cam on the cam shaft. The cam having a long and short side imparts to the building rail a quick downward traverse and a slow upward traverse. The downward traverse giving an open wind with say 30 coils to the length of the bobbin, the upward traverse rising slower lays the coils closer together and about double the number of the downward coils. The coils of the downward traverse are known as the binding coils and bind down the layer previously wound. This binding down is necessary in order that when the yarn is unwinding on the knitting machine it will unwind one layer at a time and therefore prevent a tangle. When the yarn has reached the required diameter at the base, a cup, to which the yarn guide is attached is made to revolve in an upward direction by coming in contact with the yarn. A diagram of this cup and yarn guide is shown in Fig. 2. The cup and the yarn with it,

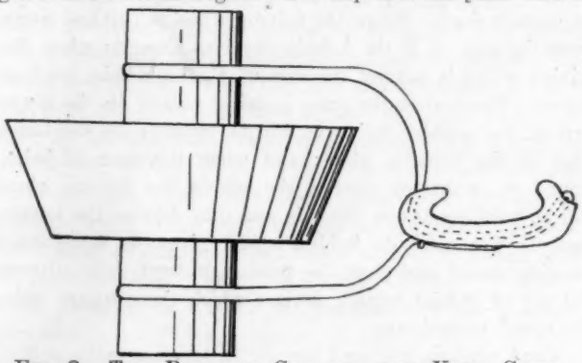


Fig. 2. The Building Cup and the Yarn Guide.

is made to rise gradually until the bobbin is full to the top of the spindle leaving the top in the shape of a cone just as it has built all the way up.

These winding machines are also provided with scraper guides which are set so that all foreign substances, slubs, bad piecings, large knots, etc., may be broken and prevent them from going on to the bobbin. Two different styles of these guides are shown in Fig. 3. The slot between the two plates can be adjusted according to the size of the yarn and the yarn being guided between them, is cleaned of all undesirable bunchy places.

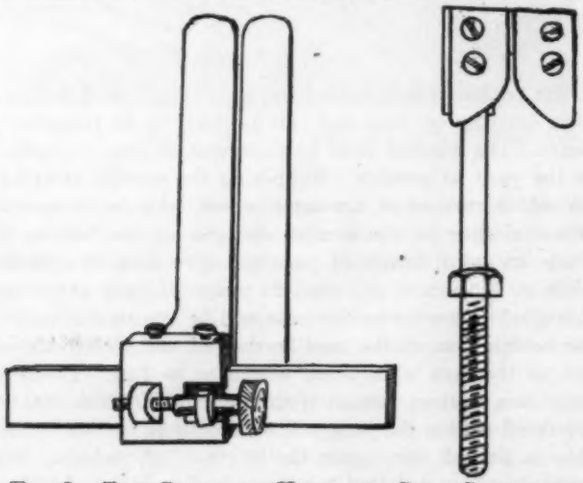


Fig. 3. Two Styles of Knot and Slub Catchers.

Each bobbin is provided with a stop motion so that a bobbin can be stopped independently of the others. The action of the stop motion raises the bobbin from the flange of the spindle and prevents it from turning. The building cup of each bobbin is also independent, so that one bobbin may be partially or almost filled and another just being started. The cup also adjusts itself to the winding of fine or heavy yarns, this enables the operator to wind several numbers of yarn at the one time if required.

In another machine of the bobbin type of winding, a friction cone drive is used to give a differential speed to the bobbin. With this method of driving the winding at the small end of the bobbin is as fast as at the larger end.

The bobbin runs at its lowest speed when winding on the larger diameter and increases its speed in proportion to the decrease of its diameter, so that the yarn runs at the same speed and with more even tension.

Another method of bobbin winding is that in which a variable bobbin speed is used. By referring to diagram Fig. 4. The driving wheel D is made to work backwards and forwards on the friction plate F, which is tight on on the spindle shaft. When the driving wheel is furthest away from the axis of F the bobbin revolves slowest; when the driving wheel is nearest the axis of F, the bobbin revolves fastest. Thus when the yarn is being wound on the lower part of the bobbin, the drive will be working on the outer edge of the friction plate; and when the yarn is being wound on to the top part of the bobbin, the driving wheel will be working nearer the axis and thus driving the bobbin faster. The variable bobbin speed gives us a constant winding speed and thus the tension is kept even without the use of special tension devices which the constant spindle speed necessitates.

Cone winders are used largely in knitting mills and in mills manufacturing knitting yarns. The cone provides a suitable wind for yarns which have to be shipped to outside mills. The package is light and retains its shape without danger of being damaged in transit. Two per cent is usually allowed for weight of cones but sometimes yarn wound on this principle are sold on a net weight basis. There are several types of cone winders, usually referred to as, close wind, open wind, and camless winders. The first is a spindle driven machine in which the coils are spaced by adjusting the speed of the traverse. The open wind is of the revolving drum type. The particular advantage of the camless winder is that it builds a cone with a convex base. The advantage of this is that the base of the cone is not liable to get soiled by contact with lint on the knitting machines. In the case of stationary cylinder machines with a large number of feeds, the weight of the yarn being carried around on the machine is very often

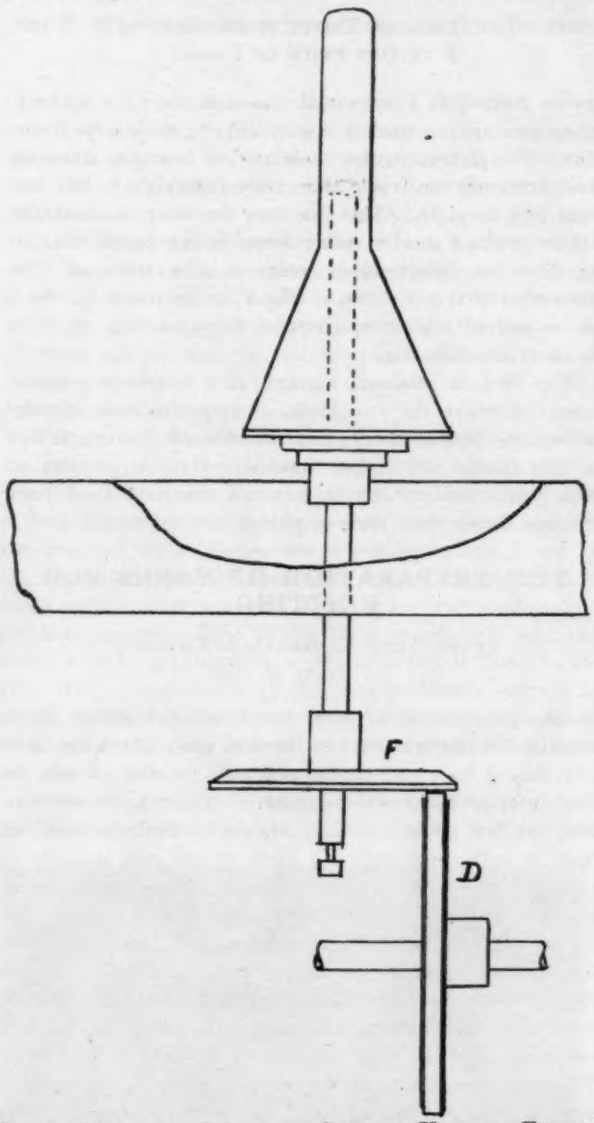


Fig. 4. Method of Driving to Secure a Variable Robbin Speed.

overlooked. Bottle bobbins, when empty, weigh over two pounds, whereas it takes quite a large number of cones to weigh this amount. Therefore cone winding is to be recommended on machines where the yarn is revolved around the machine, because of the lightness of the package of yarn.

DYEING, BLEACHING AND FINISHING.

CHEMICALS USED IN THE TEXTILE INDUSTRY.

(*Reported Exclusively for* COTTON.)

BY FREDERICK DANNERTH.

LECTURE 10.

The object of sizing is four fold and these four reasons for applying sizes may be briefly stated as follows: (1) to strengthen the yarn for weaving purposes; (2) to increase the weight of the yarn; (3) to stiffen the fabric and thus give it more "body" or "feel"; and (4) to bind the loose fibers to the body of the yarn and thus produce a smooth surface which will not chafe in the heddles.

In the practical application of size it is necessary to take into consideration certain factors among which may be mentioned: (1) the material to be sized (whether it be cotton, wool or silk); (2) the condition of the goods, whether in hank, warp or fabric; (3) the materials which are to be used for sizing, whether starch, glue, gums, etc.; and (4) the quantity of water used for preparing the sizing mixture.

The materials at the disposal of the sizer may be readily divided into groups as follows: (1) the starches; (2) starch products: (3) gums and mosses; and (4) animal products —casein and glue. The starches form the most important group of materials at the disposal of the sizer and will therefore be considered at length.

STARCH.

Starch is the first visible product of assimilation in plants. Under the influence of sunlight the Chlorophyl or leaf green has the power to split up carbon dioxide in such manner that formaldehyde is formed and later converted into starch. This product is closely related to cane sugar, glucose and cellulose all of which are designated by the organic chemist as "Carbohydrates." If we stop to consider that the general formula for starch is $C_6H_{10}O_5$, or $C_6(H_2O)_5$ and that the formula for water is H_2O it will be easy to understand the meaning of the word "carbohydrate" as the term for compounds in which the hydrogen and oxygen are present in the same proportion as in water. The chemist says that six atoms of carbon are united with the equivalent of five molecules of water, to form starch. No human being has ever been able to unite carbon with water to form starch and yet it is very easy to remove the water from the starch merely by warming it with concentrated sulphuric acid. The black color which develops is due to the carbon which remains unaffected by the acid.

The comparative value of two samples of starch may be determined in several ways of which the following is an example: 20 grams of starch are placed in a 500 cc. graduated flask and there mixed with 230 grams of water. Fifteen cubic centimeters of a 10 per cent sodium gydroxide solution is now run in quickly from a burette and the flask is filled up to the scratch with cold water and shaken continuously until the solution begins to thicken. Allow the solution to stand over night before testing its viscosity. Starch is insoluble in cold water and swells up when heated with water without forming a genuine solution.

The most characteristic chemical reaction for the substance is the blue color which is obtained when a one-per-cent solution of iodin is added to starch paste or starch powder. The roots, tubers and seeds of assimilating plants are the only sources of the starch of commerce. When examined under the microscope it is found to possess a shape which is characteristic for the source of the product. Thus Wheat-starch is composed of granules marked with concentric rings, that is, the center of the rings is in the center of the granule. Potato-starch granules are eccentric, that is, the nucleus or center point is mostly at the smaller end. Rice-starch is a so called "composite starch;" it is made up of groups of wedge-like granules. Maize-starch is composed of angular and of round globules having a radiating or star shaped mark in the center. The relative size of these granules may be designated as: Rice = 1; Wheat = 3; Potato = 10.

Starch may be rendered soluble in water in the following way: (1) by boiling with dilute sulphuric acid (yields glucose); (2) by warming starch paste to 37 degrees C. with malt infusion, (yields Maltose and Dextrin); (3) by heating starch to 110 degrees C. with a small amount of nitric acid, (yields Dextrin); (4) by heating starch with glacial acetic acid and a trace of hydrochloric acid, (yields soluble starch); (5) by heating starch with 5 per cent solution of sodium hydroxide, (yields soluble starch); and (6) by heating starch to 205 degrees C. in a suitable oven (yields dextrin starch.) From the foregoing we gather that it is not actually the starch which is soluble in water but rather an alteration of starch.

The properties of the starches which make them of value to the sizer are first the gelatinizing power. This refers to the change which takes place when a hot starch paste is cooled. The jelly so obtained is of the same kind as that obtained when glue or gelatin or albumin is boiled with water, but there is an important chemical difference as starch contains carbon, hydrogen and oxygen while the remaining three sustances contain nitrogen and sulphur in addition to these. Second, adhesiveness or binding power. This refers to the property observed when a thin layer of starch paste is allowed to dry between two pieces of paper. It is probably due to the contraction which takes place on drying and to the fact that the moist paste readily penetrates the pores of the paper or the spaces between the individual fibers. Third, thickening power. This is due to expansion and the immense absorption of water when starch is heated with this liquid. After starch has been rendered soluble by treatment with caustic soda it possesses much less thickening power. Fourth, stiffening power is due to the fact that the starch granules have first been expanded and have become merged into one another by boiling with water and secondly the water has been driven off by drying. The raw starch was not stiff as the granules could move around each other with perfect freedom but this has been changed by the boiling process. The individual granules have become "fused" to a solid mass and have lost their freedom of motion. Fifth, the agglutinating property is due to the expansion of the granules when starch is boiled with water and also to the subsequent fusion of these granules to one homogenous mass.

STARCH PRODUCTS.

Glucose is prepared in Europe from the starch of pota-

toes and in America from corn starch and may be produced in the laboratory by boiling these substances with a one per cent solution of sulphuric acid for four hours. This sugar occurs naturally in grapes and is hence known as grape sugar but the technical method of preparing it has suggested the term starch-sugar. At the present day the term glucose is restricted to liquid, sirupy products which contain dextrin as well as dextrose while those solid products which consist almost totally of dextrose are called grape sugar. When starch is boiled with dilute acid the starch takes up one molecule of water hence the term "hydrolysis" (water solution) is applied to this process.

$C_6H_{10}O_5 + H_2O = C_6H_{12}C_6$.

(starch) (water) (glucose)

One important property possessed by this substance is its hygroscopicity or power to attract water from surrounding objects, whereby a fabric may be kept pliable. Glucose is very similar to Glycerol in this respect.

Dextrin is formed by heating starch either alone or with a small quantity of nitric acid. It does not reduce Fehlings solution and differs in this respect from glucose. It is not fermentable by yeast and differs in this respect from maltose and glucose. Two chief varieties are found in commerce, the brown which has been almost totally converted from starch to dextrin and the white which represents an intermediate stage between starch and dextrin. Dextrin is soluble in water and forms a gummy solution when mixed with this liquid in the proportion of 1 to 1 hence the term artificial gum is sometimes applied to this substance. One variety of dextrin is prepared by dampening starch with a one per cent solution of nitric acid and heating to 110 degrees C. If starch be heated for some time with a one per cent solution of sulphuric acid, it will be converted into dextrin and if the mixture is boiled for 3 or 4 hours, maltose will be formed and eventually the starch will be converted into starch-sugar. This change of dextrin to sugar takes place in the germinating seeds of barley by the action of a substance termed "Diastase." This introduces to the subject of fermentation.

FERMENTS.

Ferments may be divided into two classes; the formed or living ferments, otherwise termed fungi (yeast, etc.), and the unformed or unorganized ferments, otherwise termed enzyms. Diastase belongs to the latter class—it is an albuminous substance of unknown composition produced during the germination of barley and other varieties of cereals. Although it is a well known agent for converting starch into sugar, the method of its action is as yet unknown. Malt is the term applied to barley which has germinated and been dried. Fermentation is a slow decomposition process which organic substances undergo. It is accompanied by the liberation of gas and evolution of heat and may be induced by micro-organism. The fermentation by which sugar is converted into alcohol is caused by a fungus of the genus Sacharomyces (commonly termed yeast). During this process the sugar is broken up into alcohol and carbon dioxide. Fermentation can only take place between 3 degrees and 35 degrees C. with 30 degrees as the most favorable temperature. It is further favored by dilution with water and access of air. Fermentation may be stopped by the addition of salicylic acid, phenol, or corrosive sublimate or by raising the temperature to 60 degrees C. As previously mentioned glucose or maltose may be fermented by means of yeast, lactose (milk sugar), may be fermented either by yeast fungi, or by fission fungi, or bacteria. Cane sugar can be fermented only after "inversion" a process by which it is converted chiefly into glucose. This inversion can be effected by invertin which is the enzym of yeast.

GUMS.

Gums appear to be very closely related to starch and cellulose. They are obtained as exudations from the bark of plants belonging to the genus Aecacia, Astragalus and Ceratonia. They are all soluble in water and these solutions can be filtered in the usual manner.

Gum tragacanth is obtained in the form of flattened masses as an exudation from Astragalus gummifer. It is hard, tough and difficult to powder. It may be converted into a mucilage by soaking in fifty times its weight of water for 24 hours, after which it is boiled for five hours. The mass thus obtained has excellent thickening power but is of little value as an adhesive. Tragacanth is sometimes used in conjunction with wheat-starch paste in the properties of one to one. The most usual form for the gum paste is 60 ounces of Tragacanth added to 1,000 ounces of water and this is designated 60/1000. The value of Tragacanth and the other gums may be determined by examining its viscosity, its comparative adhesive power and the absence of foreign substances such as sand. A fair sample of the gum should contain not much more than 3 per cent ash and 20 per cent water.

Gum Arabic is obtained from various species of Acacia. Gum Senegal is but one variety of this gum which is obtained in the Orient. It is less adhesive and less valuable than gum Arabic. These gums can be readily powdered in a mortar and in this condition they can be very quickly converted into a mucilage. Some commercial samples contain cherry gum and dextrin. Good specimens show less than one per cent of ash.

A solution prepared by dissolving 100 ounces in 1,000 ounces of water should yield a liquid of a specific gravity of 1.037. As good varieties of this gum are rather expensive it is replaced wherever possible by white dextrins and tragacanth. Gum Tragasol is a more recent preparation of the plant Caratonia siliqua. The part used is the pod commonly known as St. John's bread. This gum is sold in the form of a jelly to which a small amount of phenol is added for preservative purposes. It should, however, be added that any of the thickenings now in use may be kept from turning sour by the addition of such preservatives, so that this is not a characistic of gum tragasol but is a property of phenol.

MOSSES.

Irish Moss, known botanically as *Chondrus crispus*, belongs to the class of highly developed red algae. Iceland moss (*Catraria Islandica*) belongs to the same class and both are found on the coasts of the great oceans. A jelly may be prepared from these mosses by boiling 7 ounces in 100 ounces of water for one hour. Strain while hot. Both mosses are horny and transluscent and of pale yellow color. They swell in cold water but do not dissolve.

ANIMAL SIZES.

This group includes casein, glue and albumin. The first mentioned is itself insoluble in water but can be rendered soluble by a treatment with mild alkalis such as borax. A product obtained in this manner is used to some extent for sizing in the textile industry but its chief use thus far has been in the wall paper industry. Glue is obtained

from bones and tannery waste. It is used in the proportion of one pound to one gallon of water for sizing woolen and worsted yarns. Natural glue solutions gelatinize on cooling below 50 degrees Cent., but this change in consistency may be prevented by the addition of acetic acid. By this treatment the so called "soluble glue" is prepared. Pure glue has never been found to contain more than eight per cent of ash, so that this fact will serve as a basis for comparison of the commercial product. Other factors which determine the value of glue are its viscosity, its drying power and its adhesiveness.

AUXILIARY AGENTS.

If we review the several materials used in connection with the sizes we will find antiseptic agents such as phenol (carbolic acid), sodium benzoate, sodium salicylate and borax. Deliquescent agents, that is, materials which attract water and by so doing keep the fabric pliable include materials like zinc chloride, magnecium chloride, calcium chloride glucose and glycerin. Stripping agents (solvents for starch) are limited in number in fact it is only recently that the original malt infusion has been superceded by the preparation known in commerce as diastafor. This material consists essentially of reducing sugars, dextrin, soluble proteids and some organic acid. Softening agents include the waxes known as spermaceti, japan and paraffin; cocoanut—olive—and palm oils; sulphated oils; white castile soap; and finally the animal fats such as tallow, suet, lard and neatsfoot oil.

NOTES ON DYEING, BLEACHING AND FINISHING.

The Newest and Latest Chemical Facts From the Laboratories of the World. Prepared for and Contributed Exclusively to "Cotton."

BY J. MERRITT MATTHEWS, PH. D.

New Methods for Waterproofing of Fabrics.

A somewhat novel method for the waterproofing of fabrics is in the use of a tarry residue left in the distillation of birch oil. This oil is employed in the tanning of Russia leather, and after its distillation there is left a tar-like residue of a greenish color. This substance is not attacked by either acids or alkalies. It is dissolved in alcohol and this solution is employed to impregnate the material to be waterproofed. After drying, the tar is said to be no longer soluble in alcohol, and is very resistant to any atmospheric action. It is claimed that the fabric after the waterproofing shows no evidence of the treatment, and that the characteristic properties of the cloth are in no wise changed, not even the color being affected. The cloth retains its original elasticity, and is very resistant towards acid solutions, seawater, and atmospheric influences. This birch-tar, if it possesses such remarkable waterproofing properties would surely be a most desirable product. (See *Oesterreichs Wollen-u. Leinen Industrie,* 1912; *Farber- Zeitung,* 1912, page 57.)

Another process for waterproofing is described by Watremey in French Patent 432,013, of Nov. 25, 1911. This process depends on a treatment of the cloth with a solution of gelatine and aluminium borate. In a previous patent (French Patent 427,573) this same inventor describes the use of gelatine and aluminium tannate, but it has been found that the color of the aluminium tannate affects the brightness of the colors with which the fabrics may be dyed. To obviate this difficulty the use of aluminium borate is now proposed. In carrying out the process, a bath is prepared containing a solution of gelatine, and there is added aluminium acetate and borax, in the proportion of 5 quarts of the acetate to 2¼ pounds of borax. The cloth is thoroughly impregnated with this solution. A modified process is to employ a solution containing gelatine, alum, borax, and formic acid. The cloth is steeped in this cold liquor, which by reason of the presence of the formic acid, does not precipitate out the aluminium borate. After the impregnated cloth is dried, however, the formic acid is volatilized, and the insoluble aluminium borate is formed, which produces a coagulation of the gelatine.

A recent English patent describes the use of a new form of rubber substitute for the waterproofing of fabrics. Menhaden oil is well mixed with 1 to 10 per cent of its weight of finely divided cotton. To this mixture there is added 3 per cent of sulphur monochloride diluted with its own volume of petroleum ether, and the mass is well macerated for about 6 hours. The cotton gradually dissolves in the oil; then 4 to 5 per cent more of sulphur monochloride, similarly diluted with petroleum ether, is added, and the mixture again stirred. There is then added 15 per cent of precipitated chalk, and after two hours maceration, 20 per cent of painter's drier. The mass is then strained, and the solution is ready for use. It is applied with an ordinary paint brush to the fabric to be waterproofed. (See English Patent, 21,229, of 1910.)

In another English patent of recent date, the following mixture is recommended: 1 pound Non-explosive nitrated cellulose; 1 pound Ether; 1 gallon Methylated Spirits; 3 gills "Lucrate"; ¾-ounce Sodium tungstate; and 1 pound of Pigment. Before using, dilute as required with 1 to 6 gallons of methylated spirits. The use of this mixture renders cloth waterproof, air-tight (for ballons and aeroplanes), and fireproof. The treated fabric is said not to stick or crack, and has no odor. (See English Patent 18,607 of 1911.)

The non-explosive nitrated cellulose referred to is prepared as described in English Patent 18,606 of 1911. This cellulose dissolves to a smooth jelly when treated with a mixture of ether and methylated spirit. The "Lucrate" is an oil prepared as described in English Patent 11,340 of 1909. The sodium tungstate is added for the purpose of making the treated fabric non-inflammable.

Methods for Increasing the Fastness of Direct Dyes on Cotton.

The importance of the direct or substantive dyes for the dyeing of cotton is now universally recognized. One difficulty in the use of many of these colors, however, lies in their lack of fastness. In order to overcome, or at least minimize, this objection, a number of methods are at present employed. It is often possible to materially increase the fastness of the color to light and washing by an after treatment of the dyed fabric with a solution of certain metallic salts, or by a process known as diazotizing and developing.

The metallic salts which are most frequently used for this purpose are copper sulphate (bluestone) and potassium bichromate (chrome). The effect of the first salt is to increase the fastness of the color to light; while the effect of the second is to increase its fastness to washing. In place of the potassium salt, sodium bichromate may also be

used with like effect. Fluoride of chromium is also sometimes employed, and more rarely nickel sulphate. In all cases, the coloring matter forms either a combination with the metallic salt or undergoes an oxidation.

The process by which this treatment is applied is usually as follows: The dyed fabric is well washed and then treated in a bath containing 1 to 3 per cent of copper sulphate and 1 to 3 per cent of acetic acid. The temperature of the bath should be 160 to 180 degrees F., and the time of treatment from 20 to 30 minutes. This process is particularly adapted to certain blue substantive dyes, such as Benzozurine G., Diamine Blue RW., Brilliant Cupramine Blue RB, etc. Usually the tone of the color is slightly dulled and changed by the treatment.

A greater degree of fastness to washing may be obtained by treating the dyed fabric in a bath containing 2 to 3 per cent of chrome (or fluoride of chromium) and 2 to 3 per cent of acetic acid.

The two treatments may also be combined and given simultaneously; in which case the bath is prepared with 2 to 3 per cent of copper sulphate, 1 to 2 per cent of chrome, and 3 to 4 per cent of acetic acid.

Another method for increasing the fastness to washing is to give an after-treatment with formaldehyde. The dyed fabric is rinsed and then placed in a bath containing 2 per cent of formaldehyde and 2 per cent of acetic acid. The temperature of the bath should be about 140 degrees F. This treatment may be combined with the copper sulphate process by using a bath as follows: 1½ per cent of formaldehyde, 1 per cent of copper sulphate and 1 to 2 per cent of acetic acid. This bath should also be used at a temperature of about 140 degrees F.

As a precaution in the application of any of these methods it must be borne in mind that all baths containing copper sulphate cannot be used in machines or dyevats containing iron.

It has been found that a treatment with nickel sulphate also materially increases the fastness of many direct dyes to light. This solution, though more costly than that of the copper sulphates, possesses the advantage, however, of not being affected by the presence of iron. The bath is prepared with 2 to 3 per cent of nickel sulphate and 2 to 5 per cent of acetic acid. It may be combined with the chrome treatment by using 1 to 1½ per cent of nickel sulphate, 1 to 1½ per cent of chrome, and 2 to 5 per cent of acetic acid.

The diazotizing process at the present time is frequently used for increasing the fastness of colors on cotton, as it possesses many advantages; it increases the intensity of the color, the fastness to light, to acids, to washing, and to fulling. In this treatment the chemical constitution of the coloring matter dyed on the fibre is naturally of great importance.

To carry out this process the material is first dyed with a direct color capable of undergoing the diazotizing reaction. The dyed fabric is then rinsed and treated for 10 to 15 minutes in a cold bath containing 2½ per cent of sodium nitrate, 7½ per cent of hydrochloric acid (or 5 per cent of sulphuric acid). These proportions are suitable for heavy shades, and for lighter shades they may be somewhat reduced. After diazotizing the material is rinsed in cold water and immediately developed in a fresh bath containing ½to 1 per cent of beta-naphthol dissolved in a corresponding quantity of caustic soda. This bath is also employed cold and the developing is complete in 20 to 30 minutes. Other developers besides beta-naphthol may also be used, depending on the dyestuff employed to start with and on the eventual color desired. Other developers commonly used are resoreine, phenol, Bordeaux developer, metaphenylenediamine, meta-toluylenediamine, and naphthylamine ether. After coming from the developing bath the goods should be well washed to remove all excess of adhering developer.

A modification of this process is to use a developer which may be diazotized directly and coupled with the dyestuff in the fibre. For this purpose paranitraniline is principally employed as the developer in the following manner: 2¼ pounds of paranitraniline is mixed with 2 gallons of water and 2½ quarts of hydrochloric acid; after cooling the solution is diluted to 4 gallons with water, and 1½ pounds of sodium nitrite dissolved in 3 quarts of water are added. This mixture is stirred for 15 minutes then diluted to 25 gallons. The treatment is carried out as follows: For 100 pounds of dyed goods use 6 to 12 gallons of the diazotized paranitraline liquor; ½ to 1 pound of soda ash; and ½ pound of sodium acetate. The goods are treated for 15 to 30 minutes and then washed. Some of the sulphur dyes on cotton may be advantageously after-treated with an oxidizing bath. Hydrogen peroxide or sodium peroxide are sometimes used, as well as solutions of sodium hypochlorite.

New Process of Dyeing Sulphur Colors.

A new product has recently been dicovered which has been suggested as a suitable substitute for sodium sulphide in the dyeing of sulphur colors, and is said to obviate the many inconveniences in the use of that body. It is prepared by the reaction of formaldehyde on sodium sulphide. Chemical examination shows the new body to be trithionate of formaldehyde. It is used in the dyeing of the sulphur colors in the same manner as sodium sulphide. (See Bulletin Industrial Society of Mulhouse, 1911, page 183.)

Difference Between the Action of Common Salt and Glaubersalt in Dyeing.

It is not generally known that there is a difference in the chemical effect between common salt (sodium chloride) and glaubersalt (sodium sulphate) when added as an assistant to the dyebath. Frequently these two salts are employed indifferently in the dyeing of cotton with the substantive colors; though for the dyeing of wool and union goods, glaubersalt is generally used. Recent investigations have shown, however, that in solutions of sodium sulphate, even at ordinary temperatures, the salt undergoes a partial hydrolysis leading to the formation of caustic soda and sodium bisulphate:

$$Na_2SO_4 + H_2O = NaOH + NaHSO_4.$$

At a boiling temperature this hydrolysis is quite marked. This may serve to account for differences which are sometimes to be observed in the dyeing of union goods, depending on whether common salt or glaubersalt is added to the bath. It may also account for the effect on certain dyed colors when boiled in a bath containing glaubersalt when no effect is noticed and when the bath consists only of pure water. Also, in using dyestuffs on cotton sensitive to the action of alkalies, better effects are obtained by employing common salt than when adding glaubersalt.

Practical Problems Discussed by Cotton's Readers.

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all.

WEAVING ASBESTOS.

BY H. J. V.

Editor Cotton:

I desire very much to learn more about weaving asbestos on a tape loom. I am intensely interested in this work and would like to find out more about it. Will you secure some contributions along this line if possible, or perhaps some of your readers may be willing to furnish some information through the columns of this department.

WASTE IN AMERICAN COTTON MILLS.

BY C. M. STOY.

This subject covers a large field and is not confined simply to the waste of cotton. Although in the year 1910 there was exported from this country to European countries 45 million pounds of cotton waste. Out of this waste the poorer population of Europe were provided to a great extent with clothing, underwear, blankets, carpets and so forth. It was bought cheap enough for the European manufacturer to make a handsome profit after all costs, including over head charges and transportation expenses.

This is a serious problem which is confronting the manufacturer. Especially so, as the price of cotton has increased from 50 to 100 per cent in the last few years and the help have not been taught how important it is to be saving. So today the manufacturer is confronted with the two extremes, high priced cotton and operatives that have not been schooled along economic lines. Especially are these conditions so in some Southern cotton mills and the old adage of "willful waste makes woeful want" was forcibly impressed on both manufacturer and operative alike last year when cotton mills all over the country were forced on short time.

If this careless system of waste was not practiced and every thing of value was looked after and conserved as it should by them the manufacturer would have more to tide him over in money panics and the poorer classes of this country would be benefitted thereby instead of the European manufacturers living off of, and adding to their wealth from the waste of the American cotton mills.

We live in a land of plenty. A land for the poor man where he is not down trodden under government restrictions and unjust taxation. If he will take advantage of the opportunities that are put before him and work and economize, ever keeping his face towards the goal of independence, and his aim to accumulate, his efforts will be crowned with success.

Just so in the cotton factory everything of value should be saved and utilized. Everything that can be used and worked to profit in that mill should be saved and all that cannot be reworked should be sold for something. Now the point is how much of the waste that is sold could be saved. Saved from ever becoming waste by proper handling and care on part of both overseer and operatives. Stop and consider how much the waste from the different parts of the mill will amount to in a year. Good stock in small quantities that go into waste that would not if a little care and attention were used at the proper time. Figure it out and it will be seen that a constant leakage is always going on and you will then see what is the American manufacturer's loss is the European manufacturer's gain.

The time for waste and carelessness is past in the present day of high price cotton and sharp competition. From the sweeper to the superintendent the practice of economy should be taught. 'Take care of the dimes and the dollars will take care of themselves." To begin with how much money is annually spent by some companies in the unloading of coal from cars when they could have a chute at the boiler room door and the fireman could easily unload the coal in a few minutes and not interfere with his other duties, and the expense of unloading cars would be saved. Of course it would cost the company something to build the chute but it would soon pay for itself.

Another place where economy should be practiced is in selecting a fireman. Just anybody will not do for that position, especially in a small plant where the fireman has to use his own judgment and does not have the chief engineer or master mechanic to tell him how and what to do. One had better pay well at this point when the fireman is almost wholely responsible, than when he has a head over him to direct and advise him. The poor and careless fireman can and will burn up many times his wages in the way he fires his boilers by allowing his fires to get banked and grate-bars to become choked so the draft will be cut off. Clinkers will clog the grate-bars and the steam will go down and the engine will have to run at a reduced speed or will have to stop until steam can be raised again. In a short time the grate-bars will have to be renewed, the coal bill is up, and the production of the mill is off, all caused by an incompetant fireman. Is he cheap at any price? No. He has burned many tons more of coal than he should have.

Then there is a loss in power, (which also represents dollars), by not having an economical engine which should be correctly set to give the most power for the least amount of steam consumed. Then there is in most mills a waste of steam and hot water by having steam pipes not properly protected with a suitable covering to eliminate as much condensation as is possible. While all drains from these pipes should be piped back to the hot well or heater to be used again in the boiler thereby saving water and fuel.

Driving ropes or belts should be dressed off at regular intervals to prevent slip and preserve the life of same. They should be run at just tight enough tension to deliver the

full amount of power to the shafting without being hard on the bearings. The shafting should be kept leveled and lined so that the friction load can be kept down to within eighteen to twenty per cent, thereby saving power.

The engine should be fitted with a self oiling system so that all bearings will be constantly lubricated. All surplus oil should be caught in drip pans and returned to a filter. It is wasting money to buy cheap unreliable oil, "as the best is usually cheapest." The engine should be indicated at regular intervals and valves set to the proper working position and the cost per horse power figured. The engine should never be stopped from starting until stopping time unless it be an absolute necessity as there is always a waste caused all over the mill whenever this occurs.

It is false economy to do too much patch work, for if this custom is continually practiced, in a few years the mill will be fit for the junk pile. When a piece of casting gets broken replace with a new piece, by so doing machines will be kept in good condition. It is not economy, but a very costly experiment, to run gears that have been patched up with pin teeth as they generally become loose or fly out sooner or later and break two or three good gears which will make the repair bill two or three times the first cost besides which the machine will be losing production for the second stop when there is no need for it.

All supplies should be charged against each room and each section hand in the room. By so doing it is easy to keep up with who is using or wasting the most. Each gear and part should be set and placed correctly with care and judgment so the longest life and wear of same can be had. There are more broken and worn out supplies caused from lack of oil and proper judgment on the part of the fixer than any other cause. The big trouble and cause of wasted supplies is inattention to duty, ignorance or laziness from the overseer to the oiler.

The fixer pretends to fix a machine and does not look beyond the break to find the cause, consequently he will put in new gear or piece of casting in a careless don't care way and start the machine up, he has not looked for the cause consequently in a short time there is another breakdown probably more costly than the first when by a little more work, care and attention on his part he could have saved the second repair, and the company several dollars in the waste of supplies and the loss of production.

The extravagant and wasteful habit of using belting and failing to take the proper care of same is another item. Many rooms are in operation today and the section hands are never required to scarve and cement their belts, but instead they use belt-fasteners, and you can go through the room and look at the belts and you will find from one to half dozen belt-fasterners in each belt. This is a careless wasteful habit, as everytime a belt has a fastener put into it it will increase the number of belts to be kept up by one more, besides the loss of production, waste of time, belting and belt fasteners that go along with patched up belts. And again how much good belting is allowed to be thrown around and cut up in short pieces to patch with.

Ring travelers are another costly supply, that in nearly all mills are thrown over the floor of the spinning room and found in the pocket of the spinners, and waste cans and so forth. Suitable traveler boxes should be placed on each frame and a few travelers at a time placed in them. Better put a few out at short intervals than have a constant loss by putting a lot out at a time.

A bale of cotton should contain only about five per cent of tare and in no case should it exceed seven per cent. This should be looked after closely as well as for dampness in the cotton. A pint of water weighs one pound and it is an easy matter for a bale of cotton to absorb several pints without it being noticed. When cotton is exposed to rain for several hours it will not appear to be much wet, especially if it is well put up and covered with bagging yet the bagging alone will absorb from forty to sixty pounds of water easily if exposed for any length of time in a hard rain, if bought in this condition there is loss by shrinkage in weight.

All cotton should be well dried, properly opened up and mixed before being put into the hopper of the picking machine. Quite a waste will occur if bagging and ties are not well picked when taken from the bale. Grate-bars in pickers should be set so as to give the best cleaning results without letting good stock through. Lapper help and card hands should handle laps carefully so as not to injure or tear them up. The card should be set so as to take out just enough waste as is necessary, more than this is wasteful. Strips, low grade cotton, good stock in pickerfly, cardfly, and white cotton waste from all over the mill should be run into course yarns instead of being shipped away as waste. Card hands should watch laps carefully and replace same just before laps run out. They should tear off about eighteen inches from the end of each lap just before putting on the new one, thereby avoiding choked up lickerins, heavy card sliver and waste in front of card.

Whenever an end comes down it should be spliced to the one in the can so it will run out on back of draw-frames. All light or heavy sliver should be broken out and white waste picked up off of floor. Cans should not be filled too full as the sliver will fall off on the floor and cause waste. Drawing frame operators should be watched closely and made to keep the fluted rolls carded out, clearers cleaned, and single pulled out so as to reduce the waste there to a minimum. Roving-frame hands should be instructed along the lines of economy of waste and not allowed to waste drawing and pull off unnecessary roving when creeling. Whenever a tangled bobin is made it should be carefully taken off of the spindle and carried to a table or place made to put tangled work and then the ends should be properly spliced together or tied off as they call it. Many a pound of good stock can be saved in this way. The bobbin should be marked before being doffed off of frame, then it is an easy matter to tell who is making bad work, and it can be charged up to them.

The waste made by each hand should be weighed separately once each day, thereby keeping tab on same. In the spinning room the spinners should not be allowed to pull off and waste good roving when the bobbin is nearly empty, (as is the case in numerous mills), but when it is practicable should wait until there are only a few yards left before putting in bobbins. They should have enough work to keep them busy yet not be overloaded. They should be provided with waste pocket aprons and put all white waste in same being careful to pick up any that should fall to the floor. Lifting rods should be closely looked after to prevent sticking as that means waste and loss of production. Top rolls should be kept under lock and key and when

one is needed the spinner should take it out and carry it to the section hand and get a new one, putting a drop of oil on each bearing before putting it in the frame. Extra care should be used to prevent black and oily yarn being made, and when same does happen never let it go to the weave room, especially filling as it will ruin the cloth.

Spooling should receive very close attention and care for here is where there is a big loss of good yarn caused by spoolers knocking and cutting same from bobbin. When a head comes off of a full spool, it should be carefully handled and the yarn run off onto a good spool. Tangled spools and lost ends should receive special attention as a poor spooler hand will cause lots of waste that way.

Nothing but the best of dyes and most reliable and fast shades should be used in the dye house as a poorly dyed and unreliable color will soon put that mill in bad standing. Therefore it is a wise policy to have a dyer who thoroughly knows how to mix his drugs to produce the desired shades. Dye stuffs are expensive and a poor dyer is a very costly man to have as he will waste his dyes, ruin the stock and lower the reputation of the mill. Beaming should be carefully looked after so that crossed up ends will be a thing of rare occurrence, as poor beaming will produce bad running beams with lost and crossed up ends, consequently, waste and loss in production. The warper hand should be careful not to cross her ends when mending or tying up one. Each set of beams should contain the same number of yards otherwise there will be an extra loss on back of slasher. Enough friction on section beams should be used to make all beams in a set run out as nearly even as it is possible to be. What extra yarn there is left utilize it in making comb bands for cards. This can easily be done with a hand banding machine that can be made for making small three ply rope by the mill machinest.

The slasher man should be very particular to boil his size and keep same just to the right consistency so that it will penetrate the yarn and same will be thoroughly dried before being wound on the beam, otherwise there will be a loss from mildew. If the size does not penetrate the yarn properly, it will chafe off in the loom so instead of the cloth getting the benefit of the size most of it will go onto the floor. Therefore causing a waste of size and a badly woven and poorly finished piece of goods. In starting the yarn on the loom beam at the slasher, each beam should have a piece of canvass about four feet long fastened to same with holes in the loose end to admit of tieing the starting end of warp to it, so that when warp runs out on loom the whole length of the warp can be woven into cloth, otherwise there is a waste of several pounds of good yarn at the end of every warp which should be sold for good cloth instead of being put into the waste.

All bobbins of filling should be kept off of floor, otherwise there will be dirty and greasy streaks across face of cloth which will have to be put into the seconds. Weavers should be especially diligent in their efforts to make perfect cloth for if it is ruined at the loom not only the cost of the cotton is lost but the whole cost of manufacturing up to this point. In finishing cloth, the utmost care should be used in order that every yard is run through an inspecting machine so that nothing but number one cloth goes into the best quality. That all the machines are set so that the best results are obtained and that a perfect finish is put on to the face of the cloth. All loose ends from selvage must be taken off and only a small percentage of the output of the mill should find it's way into seconds.

By eternal watchfulness and care all along the line from superintendent to sweeper, all hands ever watching for waste and using their utmost care to prevent same; always bearing in mind economy; the saving and preventing of waste at all points; production, but not at the expense of quality; discipline and system; and an eye on the waste house as well as on the inside of the mill, "then, and not until then, will American cotton mills come into their own" and the European waste manufacturer look to other fields for his raw product.

SOME ORIGINATE, OTHERS COPY.

BY GEO. D. BURTON.

The human heart, that mighty engine of our existence, runs sometimes for a hundred years, sending the life-giving fluid by valvular action to all parts of our system, to have it return and again sent forth; the process being continuous, as long as the shell containing it remains in condition to support its pulsations.

We do not find in all the handiwork of man a piece of machinery capable of withstanding anything like the constant strain and wear consistent with the working of the human heart. The nearest approach to the mechanical action of the heart, as given to the world by the ingenuity of man, we find in the pulsometer; this instrument is operated without the intervention of a piston for the circulation of fluids by valvular action and is man's copy of the construction and working of the human heart.

We have learned much from the study of animal life and the natural conditions surrounding our existence. Man has copied many of his achievements from the works of his Creator. The silk worm taught us how to spin and the spider how to weave; the wasp how to make paper from wood; in the dragon fly we find the original of one of the successful types of flying machines; the propeller of the modern steam turbine is copied and patterned in shape corresponding to the tail of the shark; in the crab we see the principle of the grappling hook; the clam's shell has a hinge; the lobster's claws resemble our pinchers or tongs; in the long legs of the grasshopper we find all the action of the modern haytedder; the many legs of the centipede resemble the teeth in the farmer's rake; the glow or firefly with its intermittent show of light is quite like our present lighthouse, giving out its intermittent flashes of light to warn the lonesome mariner; the elephant blows his trumpet, and, like a mighty engine, the whale spouts forth a tremendous stream of water; the crocodile possesses that vice-like grip so often required in our mechanical pursuits; the treeborer cuts its way like a carpenter's auger; the mole, the gopher and the hare are subway and tunnel builders; the swallow builds an adobe house, while the tarantula lines the walls of its home with a soft, downy substance and places a hinged door over the entrance and fastens the door on the inside when at home; in proportion to its size, where do we find in all creation a greater producer of an article of commerce than the little honeybee?; consider the system and precision with which all the work of this busy little insect is carried on; it builds its storehouse, then fills it, colonizes and is ruled by a Queen; who taught the beaver to dam the stream and hold back its waters for use in its playful hours?

In the animal we find a student of the Creator; in man, a copyist.

NEW MACHINERY AND TRADE NOTES.

DOES ADVERTISING INCREASE THE PRICE OF GOODS TO THE CONSUMER?

BY W. M. BOGGS, OF THE CORTRIGHT METAL ROOFING CO.

Scarcely a day passes that the proposition is not put to our salesmen, and we presume the same experience is had by salesmen of other standard lines—"Meet this price, and you can have the order." The price referred to, usually being the quotation of some competitor of imitation goods, who claims that because he doesn't advertise he is relieved of this fixed charge, and therefore he is able to sell the goods cheaper.

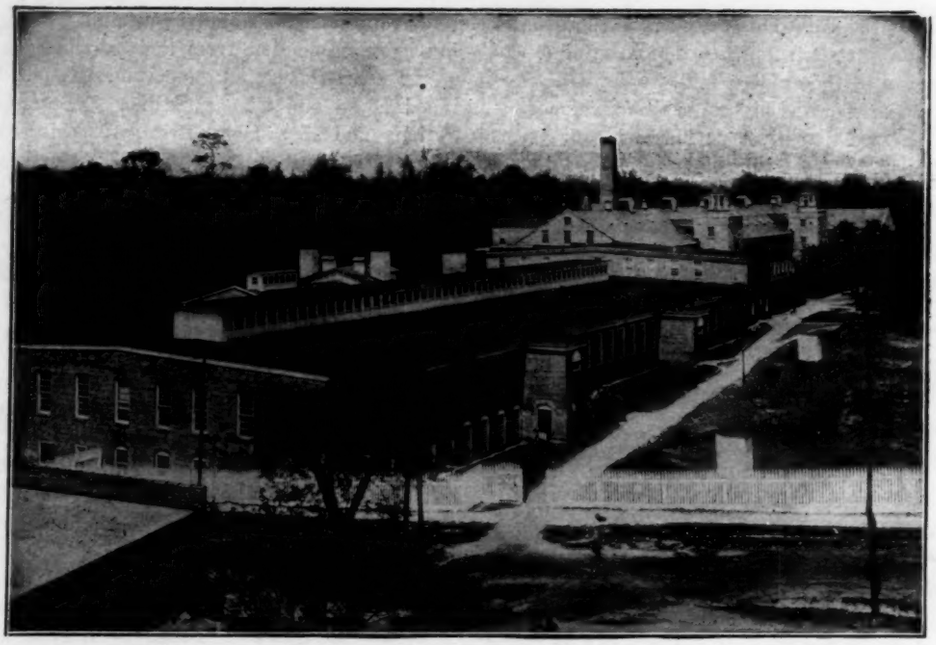
The fact that he thereby admits he is trading on some one else's reputation, by taking advantage of a condition created by the other party, doesn't worry him a bit. He glibly states, and in some cases it is true, that we are both buying raw material from the same source. He even goes further and displays practically the same design of shingle, which he has copied from us, and to all intents and purposes it looks like ours to the consumer, or it may be the dealer even. Yet both will turn around and offer us the business, if we will meet the price. Why? Simply because they have become so thoroughly impressed with the truth of the statements we have made through the advertising columns of the various papers during the twenty-six years we have been in business that there is no room for doubt that the Cortright Metal Shingle is all we claim it to be, but—that story about the advertising increasing the price has sunk in.

"Why should I pay the price for a name, if these other shingles are just as good?" he says. True, quite true, you wouldn't do it, nor would I, but—has the advertising increased the price? Has advertising had anything to do with marketing of the goods at all? Did our advertising create a demand for metal shingles? If it did, if the metal shingle was something that the public didn't want, but because we spent our money and the publisher inserted our announcements, the public was forced to buy our goods, then the publisher was a thief and a robber. On the other hand, if the demand already existed, and our advertising merely told the public where they could get the very thing they wanted, made in the way they wanted it and at the price they wanted to pay, then we both did the public a service for which we are entitled to a just reward for our efforts. But does that mean that we should get more for our goods because they were first in the market, were first advertised, and are largely advertised today? Certainly not, nor do we expect it, and what is more, the other fellow knows we don't expect it. He knows further that advertised goods as a rule must maintain a higher standard of quaity than the non-advertised article. The man who advertises must convince the prospective purchaser that his goods have greater merit than all other competitive articles. In the case of metal shingles, the competition is not with metal shingles alone, but with wood shingles, slate, pain tin and other patented roofings. So that the advertiser of this line has a big story to tell and the goods must size up to his claims, therefore, they must be made on a quality basis and price must only cut a secondary figure.

In proof of this, and to show to what effort we go to protect the consumer, we found the imitators making the strongest bid for galvanized goods, where to those who do not know, very little apparent difference existed. We found these goods were often sold as genuine Cortright metal shingles, so to protect ourselves and the consumer we emboss the words, "Cortright Reg. U. S. Pat. Off." on the fourth ridge of each shingle, thereby setting down the reputation of this company as a guarantee that each shingle is as represented, and further that the quality of the shingle is not regulated by the price.

As a matter of fact, with the large advertising we are doing we get less, and Cortright metal shingles cost the consumer less today, considering the increase in cost of raw material and labor, than previous to 1900, when we did practically no advertising, and this condition has only been made possible by the increased volume of business, for the quality of Cortright metal shingles has steadily increased as the makers of the raw material have found ways to improve their product, and our experience enables us to improve our methods of turning out the finished product. What's more, we intend to keep on improving the quality and possibly give them wider publicity, irrespective of the price quoted by the imitator, as our experience has been that in selling a man a roof he is as much interested in what it is going to cost him after it is put on as before, and the only way to give satisfaction is to put the quality into it that will last. When you can point to roofs put on twenty-six years ago as good as new today, and have never needed repairs, it takes a mighty lot of price argument, and advertising-increasing the cost, talk to convince him that he is going to save in the long run by buying an uncertainty. That's why it pays to advertise.

The Farbenfabriken of Elberfeld Co., 117 Hudson St., New York City, are sending out to the trade a new pattern card entitled "Handkerchiefs with Algole-Dyed Borders." With this pattern card are enclosed a half dozen handkerchiefs dyed with the well known Algole colors to be tested as regards to fastness, washing, light, chlorine, etc., by being put to practical use. The following colors were used in their preparation: Handkerchiefs with red borders:—dark red, Algole Red B; pink, Algole Red R extra; strawberry, Algole Bordeaux 3 B. Handkerchiefs with heliotrope, yellow and medium blue borders:—heliotrope, Algole Corinth R; yellow, Algole Yellow 3 G; medium blue, Algole Blue K. Handkerchiefs with olive, fashion brown and copper borders:—Olive, Algole Yellow R and Blue K; Fashion Brown, Algole Yellow R, Orange and Grey 2 B; Copper, Algole Orange R, Yellow R and Grey 2 B. Handkerchief with violet, light blue and golden yellow borders: Violet, Algole Brilliant Violet R; Light Blue, Alizarine Indigo G; Golden Yellow, Algole Yellow R. Handkerchief with Grey, Reseda and Salmon borders: Grey, Algole Grey 2 B; Reseda, Algole Olive R; Salmon, Algole Orange R. This is an entirely new and unique method of preparing a pattern card.



The Old Graniteville Mill.

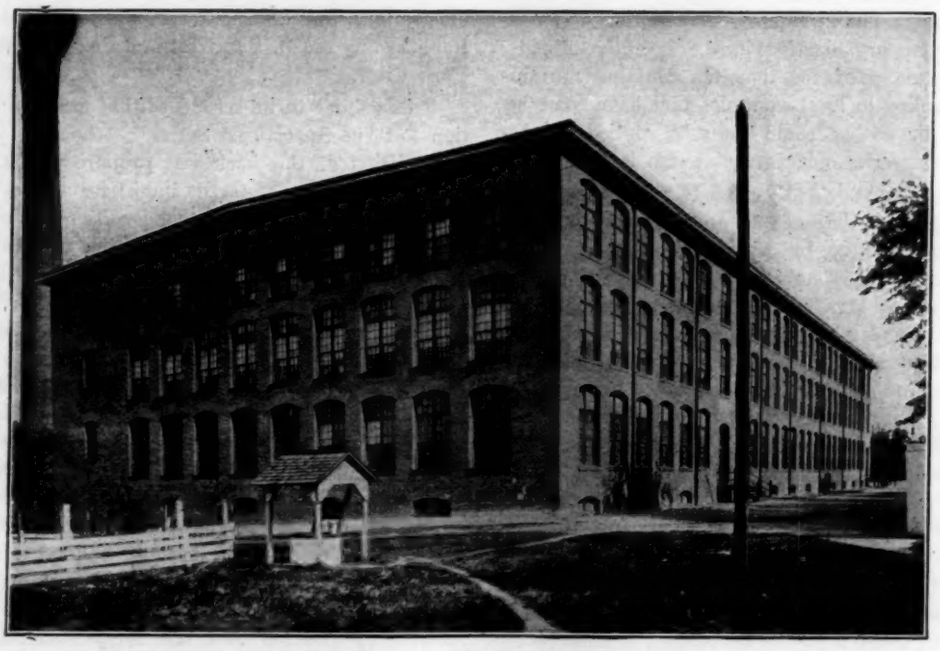
THE OLD AND THE NEW.

The two illustrations shown tell the story of the industrial progress of the South. They tell, too, the story of how Rice's Mill White proves its superior worth in the oldest industrial establishments of the country, as well as the most modern.

The old Graniteville Mill at Graniteville, South Carolina, is the oldest mill in the South which has been in constant operation and which has had an uninterrupted history of industrial success. The construction of the old mill began in 1846, and the machinery was started in 1847.

In 1900, the company built the new Graniteville Mill (known as the Hickman Mill). When the question of interior finish was considered, Rice's Mill White was determined upon, as the paint that would be most effective in dispelling shadows, that would utilize every ray of light, and that would have the highest sanitary value.

So thoroughly did it prove its merit, that the company became convinced that by its use, the Old Graniteville Mill could be made as light as a modern mill. The old structure, being of the early period of mill construction, did not have the expanse of glass that characterizes the mill architecture of today. Yet it was found that Rice's Mill White, by reason of its wonderful reflective power, provided working conditions that compared favorably with



The New Mill at Graniteville, S. C., Known as the Hickman Mill.

those of a modern structure. This new, efficient mill paint is thus used to give a modern finish to the old mill, and to give added efficiency to the modern mill.

This paint, which is of the highest sanitary value, produces a smooth surface that gives no lodgment for germs and is easily cleaned. It sends the light into dark places, thus dispelling shadows and microbes, and it flows and lays easily and evenly. It possesses great covering power and intense body, and two coats will cover better than three of lead and oil, while it holds its pure white color far longer. It is prepared by the UNITED STATES GUTTA PERCHA PAINT CO., of Providence, R. I., who will gladly supply specifications telling precisely how large a quantity will be needed to cover any given wall space, or mill building.

BOOK REVIEWS.

PROFIT MAKING IN SHOP AND FACTORY MANAGEMENT. By Charles U. Carpenter. 146 pages. Price $2.00. Publishedby The Engineering Magazine, 142 Nassau St., New York City.

This study of works management methods will be found to be marked throughout by the clear sight, the fair mind, the direct dealing, and the strong vitality of a man who has long been at the head of large manufacturing industries. This volume is one of the well known "Works Management Library" of The Engineering Magazine and is one that is well worthy of a place on the library shelves of every fac tory manager. The chapter headings are as follows: The reorganization of a run down concern; The practical working of a committee system; Reports, their necessity and uses; The designing and drafting department; The tool room, the heart of the shop; Minimizing the time of machine tool operations; Possibilities concerning the use of high speed steel; The determination of standard times for machining operations; Standard times for handling the work; standard times for assembling; stimulating production by the wage system. Stock and cost systems as a factor in profitmaking; The upbuilding of a selling organization; and Effective organization in the executive department. A great many of the thoughts contained in this volume while applied to local examples that have come before the eyes of the author, could easily be applied in other classes or factory work, and are well worth looking after.

MAXIMUM PRODUCTION. By C. E. Knoppel. 365 pages, with diagrams. Price, $2.50 prepaid. Published by The Engineering Magazine, 142 Nassau St., New York City.

In this book, which is eminently fitted for the perusal of mastter mechanics, Mr. Knoppel has considered the machine shop and foundry as twin factors in production, so closely related throughout a vast range of metal manufacturing, that their problems can best be studied together He lays down the principles of organization and management common to efficient operation and maximum success in both of these establishments, and follows out special applications in both cases. While the author has prepared these studies for the metal manufacturing shop, still they are thoroughly applicable to the large repair shops which are often connected with the various textile plants. No matter how large a shop may be, or how small it may be, in order to make of itself a paying investment it must be efficient. Master mechanics and shop foremen as well as superintendents will find the ideas contained in this book of great value and assistance in attaining better organization and more production from their auxiliary machine shops.

TEXTILE DESIGN, PURE AND APPLIED. By Thomas Wood house and Thomas Milne. 515 pages. 307 illustrations and diagrams. Price, 10 shillings net. Published by MacMillan & Co., Ltd. St. Martin's St., London, England.

The authors of this book are well known to the readers of COTTON inasmuch as both have been frequent contributors to its columns. Mr. Woodhouse is connected with the Dundee Technical College and School of Art and Mr. Milne is with the Lauder Technical School, Dunfermline, Scotland. In this book they have illustrated and described in more or less detail almost every important type of textile fabric, and the 307 illustrations contained therein embody over 1,400 different designs, plans, intersections, and photographical productions of many textile fabrics. It is a thoroughly comprehensive treatise on the subject of textile technical design and should be in the hands of every person interested in that section of the textile industry, whether he be a student or a designer. A glance at the chapter headings will give a general idea of the contents of this book. They are as follows: Plain, twill, and sateen weaves; mock lenos, huckabacks, honeycombs, etc.; crepes and other ground weavers; spiders; herringbones, diamonds and diapers; Dices; Spots; Damasks; Checks and small effects; Compound fabrics; Double weft-faced fabrics; Backed cloths; Spot and similar isolated effects produced with extra warp or extra weft; Effects produced with extra warp and extra weft; Double cloths; Three and more ply fabrics; Velvets, plushes, and similar warp-pile fabrics; Brussells, wilton, tapestry, royal axminster, and patent axminster carpets; Turkish towelling or terry fabrics; Weft pile fabrics; Bedford cords, piques, toilet covers, etc.; Gauze and leno fabrics; lappet and swivel fabrics; and Silk picture designs and fabrics. The book is thoroughly indexed which makes it very convenient as a work of reference.

COLOR IN WOVEN DESIGN. By Roberts Beaumont, M. Sc., M. I. Mech. E. 372 pages. 39 colored plates. 187 illustrations, and 280 figures in the text. Price $6.00 net. Published by the D. Van Nostrand Co., 23 Murray St., New York City.

This volume in its second edition makes a notable addition to "The Specialists' Series." About 21 years ago the first edition of this book was prepared by its author, the eminent professor of textile industries at the University of Leeds, England. In this second edition the work has been rewritten and enlarged, and numerous original illustrations have been added to the text and also many colored plates which enhance its value to the textile colorist. A chapter has also been prepared on color standardization, the scheme for which was originated and developed in the textile industries department of the Leeds University, under the supervision of the author. The chapter headings are as follows: Theories of color; Attributes of colors; Contrast and harmony; Color standardization; Mixtures; Elements of textile coloring, stripes; check patterns; Simple coloring; Compound coloring; Fancy shades applied to special designs; Coloring of combination designs; Spotted effects; Coloring of double weaves and reversibles; Figured textile colored in the warp; and Weft colored figured fabrics. The book is thoroughly indexed and the many illustrations and descriptions will prove of great interest to both designer and colorist.

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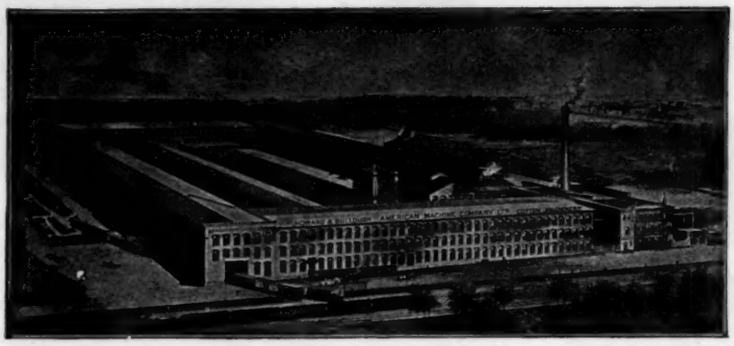

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WE INVITE YOUR INVESTIGATION AND COMPARISON

Fifty Years of Factory Mutual Insurance, compiled and privately printed and circulated by the Arkwright Mutual Fire Insurance Co., of Boston. This book is the compilation of the leading facts in the history of the work covering the past 75 years. Many lessons may be learned from this experiencee, which would be applicable and valuable in other fields. The book is not for sale, as the Arkwright Company are distributing it to members, engineers, architects, and others connected with fire prevention engineering. It is bound in boards, contains 123 pages, and is fully illustrated with both maps and half tones. This book is issued in celebration of the fiftieth anniversary of the Arkwright Company and deals with the foundation of the mutual system, the origin and growth of this system in the United States and Canada; cost of insurance over a varying period from 1850 up to the present time; construction, protection, inspection, and engineering; business methods; and co-operation among the different companies in the factory mutual field. It is well worth the study of every factory manager and its contents cover the ground thoroughly. The last chapter is devoted to Arkwright development and influence and gives some idea of the growth of the Arkwright Company from its begining to the present day. It also contains diagrams showing the returns and cost of insurance in this company and the development of sprinkler protection.

Incorporation papers have been filed with the Secretary of State, Albany, New York, by the Eugen C. Andres Co., with a capital of $100,000. The purpose of the new company is to deal in domestic and foreign cottons, having headquarters in Boston. Two of the men connected with this enterprise are well known and prominently identified with cotton mill interests in New York State. Mr. Andres has been in the cotton business for many years in Boston. The officers of the new company are: President, E. C. Andres; vice-president, John J. Ryan, and treasurer Jos. J. Murphy, of Troy, N. Y. Mr. Ryan is the New York Cotton Exchange member.

Soluble softening oil, made by The Arabol Mfg. Co., New York City, is one of the finest softening and sizing oils in the market. As a softener it far surpasses tallow. Manufacturers like it because it is easy to handle, is always reliable, and is not influenced by temperature. It gives a smooth finish to the warps, the threads divide well in the lease rods and the cylinders of the slasher remain perfectly clean. It is a natural and most suitable softener for strong and close woven goods, such as corduroys, velveteens, sateens, twills, umbrella goods, cambric warps, etc.

The Casella Color Co., of 184 Front St., New York City, are sending to the trade their supplmeent No. 73, illustrating Diamine Azo Scarlet 4 B. L. Extra and 8 B. Extra, with directions for dyeing and samples showing colors. They are also sending out their book of union shades, dyed in a slightly acid bath. This booklet contains dyeing receipts and samples and is one that will prove very interesting to all practical dyers engaged on these lines of work. It will be sent to any dyer on application to any of the offices of the company.

A COLOR MATCHING LIGHT.

The light from a clear north sky, the ideal light for color matching, has always been a "will-o'-the-wisp" to manufacturers who depend upon the proper matching or selection of colors as an important part of their business. At the best, this light is only available a few hours each day, a feature which places a limitation upon production, while on

Fig. 1. Color Matching Outfit Showing Screen Lowered.

dark or rainy days the absence of this much desired light places a most effective brake upon the output.

Of course, under stress of exigencies manufacturers have been compelled to do more or less "guessing" by attempting to match their colors under ordinary artificial illuminants, but this method is precarious and not countenanced by the careful man who will not jeopardize the quality of his work by this "guessing" method.

Among the industries that have been subservient to the vagaries of this north light are manufacturers of cotton goods, dyers and finishers. These conditions in fact became so burdensome and irksome in these days of scientific management, that one of the largest fabric corporations in the world some time ago appealed to the expert illuminat-

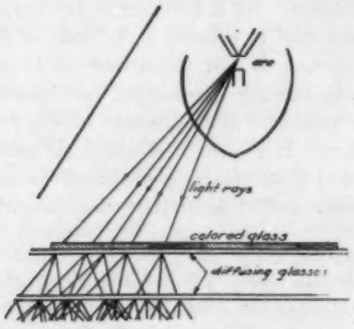

Fig. 2. Diagram of Light Rays.

ing engineers of the General Electric Company to work out this problem. Even with the extensive laboratories which that company has available the task was difficult. However, a color matching outfit was evolved which has a spectrum exactly similar to that of "a clear north sky" and is a marvel of simplicity.

The device consists primarily of an intensified arc lamp with a special casing and an ingenious arrangement of glass screens that remove the excess of red, orange and violet rays found in the spectrum of the arc light. This intensified arc lamp has always been recognized as the nearest approach to daylight of any commercial artificial illuminant and thousands are being used in the leading department stores of this country. The addition of the color screen corrects the light absolutely to that of the north light.

The color screens consist of a number of colored strips arranged side by side to take out the excess rays, and a diffusing glass whose function is to mix the light. Figure 2 shows diagramatically how this is accomplished. These glasses are made up in the form of a circle about 16 inches in diameter and are placed in the large end of a conical hood which is attached to the casing of the lamp. This hood surrounds the inner globe and is given a reflecting surface so that the light is projected down through the color screen and the direct rays are kept from the eyes of the user.

The H. B. Smith Machine Co., of Smithville, N. J., are distributing copies of the diploma which they received from the Machinery Exposition at Buenos Aires, South America, to all interested, on application. This diploma was the highest premium on five of their standard wood working machines and illustrates the high estimation in which American made machinery is held by foreign users and particularly the high grade of machinery manufactured by this company.

As the years pass by concrete as a building material is increasing in both popularity and use. Particularly is this so with many manufacturing buildings, warehouses, etc. The one complaint that is made occasionally concerning these buildings are that the walls are damp. This dampness may be thoroughly taken care of and the wall also covered with an indestructible coating that is acid resisting as well as water, weather, and alkali proof by coating it with a new material known as "Wilhelm Cementaco." This is a ready mixed coating for all classes of exterior and interior concrete and cement walls, in all classes of buildings where a thoroughly damp proof coating is required. It dries with a flat uniform finish, and it is as effective on plaster, brick, and stone, as on concrete and stucco. It will not freeze and can be safely applied at all times of the year. One coat is sufficient for most surfaces. It is also very popular for use on concrete and cement floors. To those interested, a sample card showing the fixed standard colors will be cheerfully furnished upon application to the manufacturers, The A. Wilhelm Co., Reading, Pa.

The new "Ideal" iron end frames of the Steel Heddle Mfg. Co., 2110-2118 Allegheny Ave., Philadelphia, Pa., is fully illustrated and described in a recent folder which they are mailing to their customers and friends. The claim of the makers for this iron end frame, is that it allows the use of the extreme width of the loom while the tempered steel heddle bars cannot wear into rough, saw like edges under the wear of the heddle. The wooden cross bars are made from fully seasoned hard wood that is carefully inspected before finishing and the entire frame is held firm and rigid by a simple lock in one corner. A steel wire spring holds the heddle bar secure and no matter what kind of goods you are weaving, or the width of the goods, this company will make frames for your exact needs. They will be glad to furnish information to all interested.